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Remarks on the Symptoms and Treatment of Meningitis in Children. By JOHN DAVIES, Esq., Member of the Royal College of Surgeons, Member of the Philomathic Institution, &c.

THIS disease has been usually called *acute hydrocephalus ;* but there is no more reason for calling inflammation of the investing membranes of the brain by such a name, than there would be for calling that of the pleura *acute hydrothorax*, or that of the peritoneum *acute ascites*. Whether inflammation precedes effusion into the cavities of the brain in all instances, is a question which is not here intended to be discussed ; but when a disease is known to be of one kind, it should not be called by a name which conveys ideas of diseases of a different kind. Inflammation of any of the serous membranes has a tendency to increase their secretions in a certain degree ; but it is not very frequently that *acute* inflammation of them gives rise to that degree of effusion which might be termed dropsy. That kind of inflammation which precedes dropsical effusions differs considerably in its characters from acute peritonitis, acute pleuritis, or acute meningitis. The former is of a chronic kind, slow in its progress, and is unattended by that degree of pain which is one of the chief characteristics of of the latter. There are very few instances where acute peritonitis produces ascites, and not many where pleuritis produ-

ces so much effusion of serous fluid into the cavity of the chest as to destroy the patient by its pressure. It is precisely the same with respect to the serous membranes of the brain.—When the disease is acute, the arachnoid membrane is found thickened and covered with a layer of coagulated lymph ; but in such cases there is frequently no more fluid found in the ventricles of the brain than we sometimes find in those cases where no symptoms of cerebral affection were manifest.

But the question is, how small a quantity of fluid in the cerebral cavities ought properly to be called hydrocephalus ? I have frequently found from an ounce to an ounce and a half in subjects who had had no symptoms of cerebral affection ; whereas in others, who had died of meningitis, I have found as little as three drams. Very few morbid anatomists would consider an ounce of fluid to constitute hydrocephalus, yet in children who die of acute disease of the membranes of the brain *less* than this quantity is generally found. Inflammation of the cerebral investing membranes should therefore be considered as that of any other seat similarly modified ; in one form or degree it will produce coagulable lymph, or sero-purulent matter, on the surface of the diseased membrane ; and in another form or degree, it will produce an effusion of serous fluid, so as to constitute hydrocephalus. We find this to be the case in all the serous membranes. In those who die of acute peritonitis, the intestines, the parietes of the abdomen, &c., are found all glued together by coagulated lymph, and a quantity of the same kind of fluid is found in the peritoneal cavity ; but in that chronic form of disease which produces ascites, the same appearances are seldom observable. The same is the case with respect to the pleura. The term *hydrocephalus*, then, should be confined to that chronic form of disease of the membranes of the brain which produces a gradual effusion of serous fluid into the cavities of the brain, or into the interstices between these membranes ; and which is generally slow in its progress, and longer in duration than the disease which has been commonly called acute hydrocephalus.

Meningitis is a very common disease in children ; and from inattention on the part of the parents, in not applying for assistance in time, and from the importance of the seat affected, it is often fatal in its effects. It requires a very extensive practice, as well as a great length of time, to form any correct inference of the proportionate number of deaths produced by it. No dependence whatever can be placed on the bills of mortality respecting this point, as very few of those who die are examined, and one disease is taken for another, not unfre-

quently, from merely attending to their symptoms during life. And there is another reason why no dependence can be placed on this register—a certificate from the medical attendant is never required respecting the nature of the disease of which the person died ; and those who go round to see the body do not even make any inquiry respecting that point, but pronounce it to have been any thing which they themselves think proper to call. If a certificate from the medical attendant were required in every case of death, some estimate might be formed of the proportionate number of deaths from each disease, although this could not be very correct without examination. It would be better, however, to possess a little knowledge than to be quite ignorant.

It is very doubtful whether the substance of the brain is ever the seat of inflammation, or indeed, whether it is even the seat of vessels. In some hundreds of cases which I had an opportunity of examining, I never could distinguish any inflammation of the brain itself. The vessels which pass through it are always very full of blood when the investing membranes are inflamed; but this is found to be the case in the vessels going into every part of the body undergoing the process of inflammation ; for instance, in a common whitlow the radial artery of the side affected beats much more strongly than that of the opposite side. The cerebral arteries have also not the same degree of elastic power for emptying themselves after death as those of other parts ; they are consequently, found, in general proportionably fuller than those of most of the other organs.

In every tissue we must suppose some substance to be external to the coats of the vessels. For, if we take under consideration a muscle, which is very amply supplied with blood, how minutely soever we may suppose vessels to ramify in it, there must still be fibres external to their coats. The secerning vessels will lay down fibrine at their mouths, and the absorbents will again take up the same from the approach of their orifices, although the substance of this fibrine, in the form of muscular fibre, may not be endowed with vessels. These vessels, as may be in a great degree demonstrated, only run in the cellular membrane connecting the fibres together.—This is found to be the case so far as we have the evidence of the senses ; we have therefore a right to infer, that the vessels follow the same rule in their very minutest ramifications.—Their principal branches run between muscles ; the divisions of these run between a certain number of fibres ; their subdivisions run again between a fewer number of fibres, and so

they continue to increase in minuteness, until, as we must infer, the smallest ramusculus becomes situated between two or more ultimate fibres. The same thing must obtain with respect to the coats of the vessels themselves, and with respect, also, to the characteristic structure of every tissue. The proportionate quantity of blood with which the tissue is supplied, can only be inferred from the colour of that tissue; or it may rather be said that the proportionate number of its vessels may be inferred from that appearance, because some parts give transmission to a very large quantity of blood, very little of which is expended in their nourishment. The muscles, perhaps, of the tissues which do not secrete, expend most blood in their nourishment: we infer this from their colour.

If the above inference be admitted as it regards muscular fibres, it must be admitted also with respect to nervous fibres. The medullary fibres of the brain must be a secreted substance, produced by the vessels of the delicate membrane which envelopes each fibre; but there is no fact from which we can infer that the fibre itself is endowed with vessels. If, then, each fibre is destitute of vessels, all the fibres put together must be equally destitute; because the whole bulk of the fibrous medulla can only be considered as a collection of single fibres. Admitting this to be true, and admitting, also, that the quantity of blood expended in forming a part is in proportion to the redness of the colour of that part, (putting out of the question such an organ as the lungs, which only gives *transmission* to the blood,) it must follow that the quantity of blood expended in forming the medulla of the brain is not very great, in proportion to that which goes to form many other parts of the body. But as the quantity of the secreted substance is very great in proportion to the number of the vessels which secrete it, it must follow that the absorption of this substance is very slow, and that a complete renovation of it does not take place so often as that of other parts. That the absorbent vessels of the brain are not so numerous, or not so active, as those of other seats, is proved from the comparative length of time which they take in removing extravasated blood, or any other effused fluid.

Admitting the above inferences to be correct, it must necessarily follow that the medullary substance of the brain is not subject to inflammation; because a part which has no vessels cannot become inflamed. The membrane which invests, and which produces every fibre, may become the seat of inflammation, and consequently destroy or disorder the function of that fibre, inasmuch as its very existence depends upon this

membrane. But as the medulla is a modified secretion, destined for the performance of a particular function, and, consequently, endowed with the principle of life for that performance, it may become the seat of disease independently of its investing membrane ; but this disease will not be characterized by inflammation : it will manifest itself by symptoms connected only with the functions of sensation, thought, as well as with others dependent upon the centre of nerves.

The pia mater, or the membrane which forms the cerebral substance, must be considered as performing two offices, if it be true that it is a serous membrane. Its inner surface must be adapted for secreting brain, and its outer surface for secreting serum : but before it has these two offices attributed to it, there should be a stronger proof than at present exists, that one of its surfaces, in a healthy state, does secrete serum ; for the cellular membrane, in a state of disease, produces an effusion of serous fluid, whereas, in its healthy state, it only secretes fat from one surface. The serum, in dropsical effusions, is thrown out from the surface opposite to that which secretes the fat ; it consequently gravitates towards the lower limbs, whereas the fat is enveloped by distinct cells of membrane. The fat, although endowed with the principle of life, as forming a part of the body, is not supplied with vessels. It is true that it is *formed by* vessels, but these are the vessels of the membrane, from the surface of which the oily matter is thrown out. That the fat itself is not supplied with vessels is evident from its being often entirely absorbed. The cerebral substance may be considered to have the same relation with the cells of the pia mater as the fat has with those of the cellular membrane. Each is laid down by the secerning vessels of its respective membrane, and taken up again by the absorbents of this membrane. If this be the case, and the probability is that it is so, neither the fat nor the cerebral medulla can undergo the process of inflammation ; but each may undergo that of disease, because the relation of the morbific principle may be with the substance already formed, and not with the vessels which formed it. But it must be considered that the intersections of the fat and of the cerebral medulla, by the cells of their respective membranes, are very numerous ; the vessels, then, when undergoing, the inflammatory process, will render the colour of the part somewhat redder than usual : but this appearance is produced by the dilatation of the small vessels of the investing membranes, and not from any vessels in the fat, or cerebral medulla itself. This may be proved by

sections of either, when the vessels are much loaded with blood.

It would appear, then, that nervous matter cannot become the seat of inflammation; but that inflammation may, and often does, take place in the neurilema, or processes of pia mater, from which this matter is secreted. The nervous substance, however, being endowed with life, under a particular state of modification, is subject to disease, which will become manifest by symptoms connected with the functions of the nerves and their centre.

This view of the subject will account for many phenomena connected with disease, which can never be accounted for upon the principle that inflammation constitutes every disease. In some of the most violent diseases, such as hydrophobia, epilepsy, tetanus, some cases of mania, and some cases of fever, there is not a trace of inflammation to be discovered in any part of the body after death. From such a disease as inflammation, whose characters are so evident to the senses, one ought to expect to find some traces of it after death, if it existed during life; but in many *post mortem* examinations, the most minute dissection will not bring into view the effects of the disease of which the individual died.

It is doubtful, as has been already mentioned, whether the pia mater is a serous membrane or not; and whether the serous exhalation is not thrown out by the arachnoid membrane alone. The latter membrane possesses all the characters of a serous tissue, both in health and in disease. In meningitis it always becomes thickened, and throws out lymph, which coagulates on its surface, exhibiting a gelatinous appearance; whereas the surface of the pia mater very seldom, so far as I have had an opportunity of observing, presents the same appearances. The vessels of the latter membrane are always full, and ramify very minutely over the surface of the brain; but the coagulated lymph, and the small quantity of matter which is sometimes found on its surface, do not adhere so much to it as they do to the arachnoid, which would induce us to believe that they *generally* are produced by the latter membrane. But that the vessels of the pia mater, when in a state of disease, throw out serous fluid, no one will deny. The cellular membrane, as has been already observed, will produce the same effect, so as to give rise to anasarca.

Inflammation of the membranes of the brain is much more common in children than in grown people. This is generally accounted for upon the principle of determination of blood: but this doctrine will not account for the origin of the disease,

for something must precede the determination of blood to the head. It is true that the brain, especially in children, receives more blood, in proportion to its size, than any other part; but under ordinary circumstances, which may be called a state of health, this large quantity does not produce any bad effects. It is only that quantity which the brain ought to receive, or the quantity which is natural to the brain. The spleen is very amply supplied with blood, and so are the lungs; but these organs are not more subject to inflammation than the peritoneum and pleura, which receive but very little blood in proportion. Even if an organ received one-third of the blood in the body, if that be its natural proportion, we cannot consider it more liable to disease than another organ which may receive only one-twentieth part. Facts do not prove that the organs which receive most blood are those which are most subject to inflammation. The brain, in the adult state, receives a very large proportion of blood, yet it is, perhaps, the organ which is most seldom diseased. Even meningitis itself, in children, proves that the parts which receive most blood are not those which are most prone to inflammation; for the membrane which suffers most from the disease is the arachnoid, which, from its transparency and delicate texture in a healthy state, cannot be supposed to receive much blood; but as that quantity which supplies it in health is its natural proportion, any additional supply would be disease to it; but as the heart propels the blood in even proportions to every part, according to its texture, or according to its capacity for this fluid, some derangement, which may now be called irritation, must take place in a particular seat before it can receive more blood than its due share.

It is a law of organic life, that when any part of the body is acted upon by a cause more powerful than that which constitutes its natural stimulus, or more powerful than those with which it bears its healthy alliances, that part of the body will attract more than its due share of blood; but the irritation, in all instances, must precede the determination or attraction to a particular seat. This is proved by every fact connected with the phenomena of life. The action of the cause produces derangement or irritation, an immediate consequence of which, in tissues supplied with vessels, is an increased supply of blood.

We must then seek for some cause, in children, for the production of meningitis, more than the naturally large supply of blood which the brain receives. This cause must consist in something capable of producing irritation in the seat which,

consequently becomes diseased. This irritation may be the result of either physical or moral causes. At the time at which children are most subject to the disease, there is a concurrence of causes both physical and moral. The disease generally occurs about the age at which children are weaned, which is between the eighth month and the end of the second year of their age. The two principal causes at this period are, teething and change of diet. The former is, perhaps, the more frequent cause of the disease, from the contiguity of the seat of pain to the brain. But every one must have noticed that a disorder of the bowels, from improper food, often immediately precedes attacks of encephalic affections The disease is also frequently consequent on pneumonia or pleuritis. A child who, at present, has meningitis, had first an attack of pneumonia. As soon as he recovered of this, enteritis came on; of which he had not been recovering three days before the head became affected. It very seldom happens that a child of the age above mentioned is attacked with an acute disease of any local seat, where the membranes of the brain do not, before long, partake of the affection. This I have found to be the case in very many instances, from examining after death, in cases where there were no symptoms to indicate encephalic affection during life. There must, consequently, be a great degree of susceptibility in the heads of children at this age to become subject to disease.

Eruptive diseases are also very frequent causes of meningitis. In the winter of 1823 and the spring of this year, when the measles were very prevalent and fatal, a very great proportion of those who recovered of that disease had, in a week or a fortnight after, an attack of inflammation of the cerebral membranes. It was remarked in all these cases, that as soon as the head became affected the cough and difficulty of breathing returned. The morbid appearances in all were very nearly the same—pus in the substance of the lungs; a little fluid in the cavities of the pleuræ; the arachnoid very much thickened; a little fluid between it and the pia mater; and fluid in the cavities of the brain to the amount of between three drams to an ounce and a half. From the low state to which children were reduced by the measles, the cerebral affection was much more uccontrollable in these cases than where it arises from abdominal irritation, from dentition, or from any cause which does not previously reduce the patient very materially.

At the age of childhood there are moral causes which tend to increase the susceptibility of the brain and its membranes to disease. The organs of sense are active in the pursuit of

external objects, and the brain itself is active in comprehending and arranging the ideas produced by these objects. The latter organ undergoes a rapid development, which renders it very susceptible to every impression produced upon it. It is more sensible to pleasure and to pain than at any subsequent period. These causes, in addition to the physical ones which have been already mentioned, will in a great degree, account for the frequency of the occurrence of encephalic disease in children. There are others which add to that effect, but which, at present, would occupy too much space to inquire into.

Symptoms.—There are symptoms common to many diseases, but each disease has, in general, some symptoms peculiar to itself; but these are frequently very equivocal, especially in children. Many of the most leading symptoms which are generally allowed to be indicative of the disease under present consideration, are frequently absent, or they are present one hour and absent the very next. Thus, in one case, the child will have frequent fits of convulsion; his fists will be clenched; the pupil of the eye will be permanently contracted; grinding of the teeth and frequent screamings will be observed; whereas, in other cases, where the morbid appearances after death are quite as great, none of these symptoms occur, or, if they do, it is in a very low degree. All the above symptoms, contraction of the pupil excepted, frequently arise from irritation of the bowels, from teething, and from other affections attended with violent pain.

Very little dependence can be placed on the state of the pupil in this disease, whether we regard it as an indication of the *existence* of the disease, or as that of its *different stages*. It is sometimes quite sensible to light till within a few hours of the child's death; whereas, at other times it is insensibly contracted one hour, and quite sensible in an hour or two after. I noticed it in a child of ten months old, in whom the disease lasted only three days from beginning to end, to be quite sensible to within an hour of its death. In this case there was about an ounce and a half of fluid found in the brain.

Clenching of the fists, or a contraction of the thumb towards the palm of the hand, are also often considered as symptoms peculiar to this disease. That these symptoms are frequently present in meningitis, cannot be doubted; but they cannot be considered as peculiar to this disease alone. We should not be justified in resorting to those vigorous remedies which are necessary for the subduction of acute meningitis, unless we could discover other symptoms to guide our diagnosis than

those of clenching of the fist and contraction of the thumb.—About three months ago, I noticed these symptoms very decidedly in a case of inflammation of the mucous membrane of the bowels, attended with diarrhœa and a slight discharge of blood; but this case recovered under the use of chalk mixture, with aromatic confection, and a few small doses of calomel. The child had also occasional fits of convulsion, rattling in the throat, startings in his sleep, &c.; but as there was no particular heat about the heart, and no *wrinkling of the brows*, which I have noticed invariably to exist in affections of the brain in children, and as the nature of the disease was easily understood from the state of the bowels and of the alvine evacuations, the disease could not have been mistaken for cerebral affection. These symptoms can be regarded only as those of excruciating pain in some part of the system; but it does not follow, when other symptoms are absent, that the seat of the disease is in the brain.

Children will sometimes die in a fit of convulsion, where not the slightest appearance of disease can be discovered in the head after death. A few months ago, a child of ten or eleven months old, in perfect health, was taken in a convulsive fit, and died in a few minutes. In less than fifteen minutes from the first attack, he was placed in a warm bath, and the lungs were inflated for a full hour, but without success. In examining the body about twenty-four hours after death, no appearance of disease could be found in any part. The vessels of the brain contained rather a less quantity of blood than what is usually found to be the case in the examination of children of that age. It is probable that the cause of death in this instance was a spasm of the heart; for there is reason to infer, especially as no other cause could be discovered, that this organ partook of the general affection of the muscular system.

Meningitis may be divided into two stages; but it is difficult, in some cases, to draw a distinct line between these two. In general, a fit of convulsion and screaming intervenes between the one and the other; but in some instances these symptoms are present nearly from the commencement of the attack. The most common symptoms, at first, are pyrexia; increased sensibility of the organs of sense; the child cries, and turns its face against the breast of the person who holds it, when brought into a glaring light; it cries, also, and is very peevish when the skin is touched, or when any sudden noise is made in the room; the eye-lids are kept half-closed; *there is a peculiar frowning, or knitting of the eye-brows;* the pupil of the eye is contracted in different degrees, sometimes

very much, at other times scarcely any ; the eyes are drawn upwards frequently, so as to hide the pupil under the upper lid ; the head appears heavy, and seems to hang back and move from side to side ; very great heat about the top of the head often when the body feels cold ; the tongue and mouth are red and dry ; great thirst ; the child is exceedingly peevish altogether ; it often screams violently ; it starts frequently in its sleep, especially when any sudden noise is occasioned in the room ; the pulse is hard and quick, beating from 120 to 150, or sometimes more, in a minute, but there is no sensation of fulness produced by the stroke ; the breathing is a little difficult, attended now and then by a sort of crowing noise in the throat ; the child draws in air into the lungs, and expels it again by a sort of double expiration ; there seems as if there were two expirations, one immediately following the other, for every inspiration ; the fist is sometimes clenched, but this is not very often the case at the commencement of the disease ; the child is now and then a little convulsed ; grinding of the teeth during sleep, when a good many have passed through the gums ; the bowels vary considerably—generally they are rather inactive, with green stools, but I have noticed them in some instances to be regular, and the stools of a yellow colour before the administration of calomel ; the child appears to be sore all over, and is very sensible to every impression.

Many of the above symptoms are common to other diseases, and many of them vary considerably in different instances of the disease under consideration ; but taken altogether, they represent a tolerably good picture of the malady, as far as I have had an opportunity of observing, and of confirming its nature, after death. The most constant symptoms, and those by which the disease is more particularly characterised, are, very great peevishness, a peculiar wrinkling of the brows, which cannot well be described, but which, when once seen, cannot be mistaken, great sensibility of the external senses, drawing up of the eyes under the upper lid, and the apparent heaviness of the head.

I particularly noticed the knitting of the brows, already mentioned, not many months ago, in a grown female, who had also a violent pain in the head, amounting almost to a delirium. The pain extended down along the course of the spine as far as the sacrum. There was great soreness produced in drawing the finger along the spinous processes of the vertebræ. By the application of leeches to the temples, and all along the course of the spine, and the administration of a few pretty large doses of calomel and opium, she soon recovered.

There was not much doubt of the membranes of the brain and spinal marrow being affected in this case: but, whether the above mentioned symptom may be considered as indicative of inflammation of one membrane in particular, is difficult to decide; because, although the arachnoid is generally found more disorganized than the pia mater, in children who have died of meningitis, yet the vessels of the latter membrane are always very full of blood, and the membrane itself is not unfrequently found a little thickened.

The symptoms already described continue for an uncertain period, sometimes for no more than two or three days; but at other times for a week, nine days, or a fortnight, increasing in violence when allowed to take their course; and they are ultimately superseded by others of a different character. The child, from being peevish and very sensible to every impression, falls into a state of stupor; its limbs hang down quite motionless; it is frequently convulsed; the hands and feet become contracted; the body feels colder than before; the eyes appear sunk, and drawn upwards and inwards; the pupil is generally dilated, but I have noticed it in some instances quite moveable on the application of light; in some cases it was noticed to be insensible at one time, and perfectly sensible in an hour or two after; the pulse is now scarcely perceptible; the head appears as if too heavy to be moved; the stools are forced away during the convulsions, in a fit of which the child generally dies.

The transition from one stage of the disease into the other is, in general, accompanied by a fit of convulsion and violent screaming; but now and then the first stage runs insensibly into the second.

The symptoms of the last stage vary very considerably in different cases. I have seen children, after manifesting all the symptoms just described, become comparatively lively, and take their food for a day or so, and then taken off suddenly in a convulsive fit. In these cases, the same appearances presented themselves in the brain. In other cases, there was observed a mixture of the symptoms belonging to both stages almost from the beginning to the end of the disease.—The child would appear at one time quite stupid and convulsed, and at another fretful and peevish.

The symptoms described as belonging to the last stage of the disease have always been considered as indicative of the effusion of fluid into the cavities of the brain; but however presumptuous it may be considered in me, to differ from many high authorities, yet it is the duty of every man to state

facts which he himself has observed; and he ought to be, as he always is by those who are lovers of science and of free inquiry after truth, allowed to form his opinions upon these facts. Those who maintain that the symptoms manifested in the last stage of meningitis are those of effusion of fluid into the ventricles of the brain or between the membranes, can prove the point no farther than that effusion existed in all the cases which they examined, and in which such symptoms were manifest during life. There might be other cases which did not fall to their lot to examine, and in which no fluid, at least not sufficient fluid to account for the symptoms before death, could be discovered. Attention to the progress of the disease, and to the sudden transition, in general, from one stage into the other, would not lead us to suppose that the symptoms in the last stage are occasioned by the pressure of fluid: for we cannot suppose fluid to be thrown out, in the course of a few minutes, in sufficient quantity to produce such a pressure as to give rise to such symptoms. If it is so, how is it that the effusion does not go on in the same proportion, so as to increase the degree of pressure, and consequently, augment the violence of the symptoms till life is destroyed? whereas we find, in many instances, the child becoming more lively and sensible after some hours, and having several relapses of convulsions, followed each time by stupor and insensibility. In these cases we shall, perhaps, find no more than half an ounce of fluid in the brain after death; and in many of those who had continued in a state of stupor from the commencement of the second stage till death, we often find no more, and sometimes less, than this quantity: whereas, in others, who had scarcely any stupor at all, we frequently find an ounce and a half or two ounces, and sometimes more, of fluid in the brain. In some scores of cases which I have had an opportunity of examining at different times, I never could observe any proportion between the quantity of fluid found after death, and the degree of stupor, convulsion, and other symptoms present before death. It is true that a little fluid was present in every case; but we very seldom examine a brain without finding fluid, whether the person died of cerebral affection or not. There is much reason to believe that a great part of the fluid, found in the ventricles, as well as between the membranes, in these cases, had been exuded through the coats of the vessels after death. When the vessels are so full of blood as we always find them in meningitis, it is not unreasonable to suppose that some of the serum becomes transuded.

It is by no means improbable that the symptoms which are usually considered as indicative of effusion of fluid, are dependent upon an affection of the brain of a different kind. They may arise from cerebral irritation, the immediate cause of which is not yet understood. They are analogous to those of epilepsy, hysteria, tetanus, &c. The symptoms of different stages are different in most diseases; hence, shivering fits at the commencement of suppuration, hiccup at the commencement of mortification. Stupor is the only symptom which would lead us to suppose that those of the second stage proceed from pressure; but we should remember that the stupor is not constant. The child one hour is torpid, and another sensible. The state of the pupil also varies considerably in different cases. If, again, we consider convulsions, they are symptoms quite opposed to those of pressure. There are generally no spasms in apoplexy, nor are there any in depressions of the bone: but we find them present in epilepsy, tetanus, hydrophobia, &c., where no cause of pressure can generally be discovered after death. The irritation of the disease in meningeal inflammation will account for the symptoms, independently of pressure.

It is not intended to deny that pressure may exist in some instances; but that the train of symptoms manifested in the second stage of the disease does not, in general, proceed from the pressure of fluid, is very probable, because there is scarcely any fluid found in the brain after death in many cases, and there is seldom or never any proportion between the quantity of fluid found, and the violence of the symptoms previous to death.

Separation of the bones of the skull is not a very common occurrence in this disease. Before this takes place, the disease assumes a chronic form, and degenerates into hydrocephalus. In most instances, the child either recovers or dies before it assumes the chronic character. The apparent enlargement of the head, which is often very deceptive, unless the sutures are examined, depends upon the wasting or sinking of the body, and upon a want of power in the muscles of the neck to hold the head up, which makes it appear heavy, like a ball of lead moving from side to side. A separation of the bones, however, takes place sometimes, to a certain extent, even when the course of the disease has been short.

The dura mater is not very often found diseased in meningitis; but I have seen one instance where it was very much inflamed all over one side. The inflammation had extended through the bone, which was quite red, soft, and spongy, to

the pericranium. The latter membrane was separated from the bone. I thought, at the time, that this affection was brought on by the calomel which the child had taken; but I have never witnessed the same effect produced by it since, nor had I witnessed it ever before that time. This child had no great stupor or convulsion, yet the arachnoid coat was very much thickened with fluid between it and the pia mater. There were also about two ounces of fluid in the ventricles of the brain.

One thing may be noticed connected with the examination of the brain of children after death, although it must be known to many, which is, that whenever children die from lingering diseases which have caused great debility, the arteries of the pia mater will be found loaded with blood, and their small branches will be found ramifying so minutely as to present all the appearance of inflammation. This appearance will often present itself in cases where, from the nature of the symptoms before death, there was not the slightest reason for suspecting any disease of the head; it cannot, therefore, be considered inflammation. It is, perhaps, in some degree, a consequence of want of elasticity in the coats of the arteries of the brain.

The part of the arachnoid which is generally most diseased, is that which covers the top and posterior parts of the hemispheres.

Treatment.—In the treatment of this disease, great attention is required to be paid to the state of the system. The disease frequently comes on after severe attacks of eruptive fevers, when there is already scarcely enough blood in the body to support the action of life. In these cases, it will be found necessary to support the system by small doses of cordials, frequently repeated, while other remedies are employed for subduing the disease. But we shall consider, in the first place, the treatment which has hitherto been found most successful in cases where the attack came on from dentition, cold, alvine irritation, or when the child had not been reduced by previous diseases. If any exciting cause by which the disease is kept up or aggravated can be discovered, it should, of course, be removed as soon as possible. The gums should be lanced if any teeth are about coming out, and any irritation of the bowels should be allayed when present.

One would not be justified in trusting to one remedy in any violent disease, unless it has been found, by long experience to be an infallible specific for that disease; and, even then, if other remedies, although not so decided in their effects, should be found to assist in subduing the disease, their application should not be neglected.

I have for many years noticed that the antiplogistic plan of treatment alone, which consists of bleeding, purging, and diaphoretics, had an equivocal effect upon inflammation, especially that of serous and mucous membranes. There is some specific action going forward in the seat of disease, which determines more blood to that part than its due share, however so much is taken away from the system. This is proved to be the case in every instance when the body is examined after death from acute inflammation, and where the antiphlogistic plan of treatment has been carried as far as it possibly could have been carried. Every part of the body will be found quite pale and bloodless except the seat of the disease, whose vessels are always as full as they can hold. By reducing the quantity of blood in the system, the general strength is also reduced, although not always in the same proportion but the system requipes a certain degree of strength to resist the action of the disease; and when reduced below that degree, the disease, however acute, will gain rather than lose ground.—There are innumerable facts to prove this to be the case. In cases of peritonitis, where bleeding and purging have been carried to a very great extent without relieving the pain, and where the patient is nearly exhausted, a few doses of spirits of ammonia and laudanum, in camphor mixture, will produce a very sudden and decided good effect. I have seen many cases of this sort: but such remedies, without previous bleeding, would only aggravate the disease. These effects tend to prove that bleeding to a certain extent is useful in acute inflammations; but if carried beyond that extent, the system, or the seat affected, requires a restoration of stimulus before it can throw off the disease. Bleeding has a very powerful effect in relieving the pain for a period, but it will generally return again after a few hours, unless other remedies be applied in the mean time. A repetition of the bleeding will repeat the relief every time; but the period of ease will generally become shorter after every operation.

The above remarks will apply equally to inflammation of the membranes of the brain. When bleeding is carried very far, symptoms similar to those which characterise the second stage will often come on very soon: but moderate bleeding, in most cases, where the system is in any degree plethoric, will assist considerably in subduing the disease. I have seen eight ounces of blood taken away from the arm of a child of a year and a half old, besides four ounces more by cupping, with very good effect. This child was very stout and fat. In a few hours the symptoms returned with great violence, attend-

ed with frequent fits of convulsion. He took three grains of calomel every three hours, for six days, and had, besides, half a dram of strong mercurial ointment rubbed in the arms three times a day during that time, which did not affect the gums in the least degree; but the disease was entirely subdued, and the child afterwards recovered his strength very rapidly.

Bleeding with leeches will be found to answer better in this disease than general bleeding from the arm; for a sufficient quantity of blood may be taken away at any time by the application of from four to twelve leeches to the temples, and by applying a warm bread poultice over the bites afterwards, in order to promote the discharge.

After the application of leeches to the temples of children, it is necessary to be cautious that the bleeding is not allowed to go on too far.

About two months ago, I saw a case where the child bled to death, from the application of *only one leech*, owing to inattention on the part of the attendants. In examining the part after death, it was found that it had been bitten into the anterior branch of the temporal artery, through the coats of which there was an oval opening, of about a line in length. Every part of the body was nearly colourless, except the brain, whose vessels were quite full of blood. This was an incipient case of meningitis. When there is much determination of blood towards the head, as is the case in inflammation of the meninges, leeches will sometimes bring on a very profuse flow of blood, even when no principal branch of the artery is laid open; some attention is therefore necessary to be paid lest the bleeding should go on too far.

The application of leeches should always be resorted to, unless there be great debility present; but in cases of meningitis following eruptive disease, or following a violent attack, or repeated attacks, of inflammation of other parts, where the bleeding shall have been carried already as far as the patient could well bear, the application of leeches to the temples will rather aggravate than mitigate the disease. The child will be brought so low as to require the administration of stimulants; or, perhaps, so low that nothing can keep up the action of life.

There is always very great heat of the scalp. It is necessary to keep an evaporating lotion constantly to the head. The hair should be shaved first quite close. A solution of muriate of ammonia in water, with the addition of a little vinegar, is perhaps as good a lotion as can be used. Two pieces of linen rags should be sewn into the form of caps, and constantly used alternately, dipped in the cold lotion. When the cloth is

doubled or trebled, as it is sometimes used in applying lotions, the heat is in a great measure confined, in consequence of there being no free evaporation from the surface of the skin.

The effect of the warm bath on children is very equivocal. Sometimes it gives great relief; whereas, at other times, it increases the violence of the symptoms. It should not be used when the skin is hot, and when there are much febrile symptoms: but, when the skin is cold and pale, as is frequently the case, and when the pulse is weak and tremulous, the warm bath has been found of great service.

After leeching, I have invariably applied a large blister to the back, and kept up a continual discharge from the part by the *ceratum lyttæ*.

The depleting plan should be carried all at once to the fullest extent which the child can bear; for if any good is expected from the bleeding, the benefit will be derived from its being used at the very commencement of the disease, and at once to the extent it is intended to be carried. The quantity, of course, must be regulated according to circumstances.

I do not remember of one instance where bleeding, purging, antimonials, and blisters, have succeeded in curing this disease. They have been tried over and over again, but with no ultimately good effect. They at first moderate the violence of the febrile symptoms; but the child soon becomes so much reduced, and the disease creeps on, manifesting symptoms of the second stage, as, at last, to terminate fatally. The vessels of the brain, after death, are found quite full of blood, but every other part appears as if the child had been bled to death.

Calomel is the only internal remedy which has been found to produce any decided impression upon the disease. It is astonishing what a quantity of mercury children will bear without producing any effects on the gums. I have frequently given calomel to the amount of half a dram a day, for five or six days, but I am not aware of having ever found it affect the mouth decidedly in meningitis. When the tongue and mouth are red and dry, as is generally the case in meningeal inflammation, the administration of the medicine will bring on a little moisture in a few days; but although the mercury be still continued, no decided salivation will be produced.

It may be allowable to mention here that mercury will, in an instance now and then, produce very unpleasant effects on the system, even when given in very small quantity: but there must be a very great peculiarity of constitution before this can happen. Two children, one about three years old, and the other about a year and a half, who were brothers, had three

grains each of calomel, to be taken at bed-time, which was to be repeated the following night. It was given with jalap, for a purge. After the second dose, there came on a violent salivation in both. Every tooth which the elder had in his mouth dropt out, the under lip sloughed, and he died in two days from the commencement of the salivation. Two or three of the teeth of the younger came away. He lingered on for about a fortnight, but died ultimately. These children appeared very unhealthy before. They had excoriation about the ears and face ; and their constitutions altogether exhibited a kind of putrid tendency. Instances of this kind are very rare, and should never deter any one from using such a valuable remedy when it is considered necessary. These were the only two cases with which I ever met in children, where mercury produced any decided salivation. They took only six grains each of calomel.

Before the calomel can produce any impression on meningeal inflammation, it must be given in large doses, and repeated every two or three hours. Some allowance may be made for different ages ; but a child of a year old may take four or five grains of the medicine every three hours until the symptoms abate. There is at present a child under treatment, who, within the last three days, has taken two drams of calomel and three grains of opium. He is only sixteen months old. The mouth is now beginning to get moist, and the symptoms have considerably improved within the last twenty-four hours.— The child is of a scrofulous habit : he has at present a very considerable curvature of the spine. He was first attacked with inflammation of the lungs, then of the bowels, and lastly of the head, in a regular succession. He had convulsive fits, squinting, and constant screaming from nearly the very beginning of the encephalic attack. It is the first case of meningitis in a child where I have used opium in combination with calomel. The incessant screaming of the little patient was the inducement for its being prescribed. He had not taken more than two doses, of one-eighth of a grain each, before he was more composed, and he fell into a comfortable sleep, which lasted a good many hours. For the last three days he has been taking five grains of calomel (ʒij. a day) and one-eighth of a grain of opium, every three hours ; a blister on the back was kept open, and the head kept constantly cold with a lotion. The disease is now considerably subdued, and the child is sensible at times ; but it is difficult to prognosticate how the case may ultimately terminate.

It would take up too much room to relate in detail the treat-

ment of any particular case; otherwise several, which happened as lately as within the last six months, and where the calomel, aided by the previous application of leeches to the temples in some cases, and a cold lotion to the head, and a blister to the back, *in all*, succeeded in entirely removing the disease. One child, of ten months old, took from four to six grains of calomel every three hours for nine days. The mouth was not affected at last, but the child got perfectly well, as it is now quite stout and healthy. This was a very obstinate case, and nothing but the most resolute perseverance, and the greatest confidence, in the use of the medicine, could have saved it. It had been ill for several days before I saw it.—The head was kept constantly wet with muriate of ammonia lotion. When this was first applied to the head, the rag got dry, and required changing, every eight or ten minutes, from the intensity of heat in the scalp; whereas, after six or seven days, it kept damp for two or three hours.

Another case immediately succeeded the above, but not so formidable in its characters. By the application of leeches, lotion, and by a determined perseverance in the use of calomel, the child was out of danger in five days. The leech-bites bled very profusely in this case, so that it was found necessary to administer frequently small doses of cordial between those of the mercury. In the last stage of the disease, or even in the first stage, where the disease immediately follows eruptive fevers, or inflammation of other seats, and where bleeding, &c., have been already carried far, for the removal of that inflammation, it will be found necessary to give small doses of stimulants, otherwise the system will have no power to rid itself of the disease. I have noticed this to be the case in several instances; and where the bodies were examined after death, there was scarcely any blood found in any part but the brain. The child should also take a little arrow-root and milk frequently.

The plan of treatment above mentioned has been found very successful in meningeal inflammation, unaccompanied with disease of any other part; but it must be confessed that it very seldom succeeded where the disease followed the measles or any other epidemic affection. In every case which succeeded the measles, the lungs were found diseased. Matter could be squeezed out of their substance, and fluid existed in the cavities of the pleuræ. But the children had evidently died of meningitis, for the lungs were never so far disorganised as to render them unfit for performing their functions. If the encephalic

disease could have been cured, it is very probable that that of the lungs would have got well.

In reflecting on the cases which came on after the measles, I have reason to believe, that if the calomel had been carried farther, and if the system had been well supported by cordials, and a little nourishing diet frequently, it would have proved more successful. When no calomel was given, the disease went on very rapidly ; but when the mercury was pretty resolutely persisted in, the child always seemed to be benefited by it. The plan of treatment appeared to me then very formidable when carried very far ; but by gaining additional courage from observing its effects when carried a little farther in every case, I have been led to place great confidence in its safety, as well as in its success. Children will take a considerable quantity of calomel without receiving any bad effects from it. It is difficult to account why that should be the case, for it does not appear to act at all on the bowels. The child who takes two scruples a day, at present, has only one stool, or, at most, two stools in the four-and-twenty hours. I have noticed this to be the case where no opium was combined with it, so long as the disease continued active ; but when the inflammation was subdued, the medicine was observed to act more powerfully on the bowels.

In some cases where the march of the disease is very rapid, it will be found necessary to rub in some mercurial ointment to assist the calomel ; for the sooner the system is brought under the influence of the remedy, the sooner will the inflammation be subdued.

When there is reason to suspect effusion to have taken place in the cavities of the brain, or between the membranes, the calomel may be combined with squills ; but the power of the system must be, at the same time, supported by mild, nourishing diet, and by diffusive stimulants. From the appearances of many bodies after death, where the antiplogistic plan of treatment had been vigorously persisted in for a length of time, without allowing the patients any nourishment at the same time, there is reason to infer that they not unfrequently have died of inanition ; for scarcely any blood was often found, except in the part which was inflamed. Bleeding, when carried too far, is as injurious as, and even more so than, when no blood is taken away at all. When carried to a certain extent, it will render the disease more manageable ; but, when persisted in beyond that, the disease becomes more intractable.

The remedies proposed for the cure of meningeal inflammation will perhaps appear very formidable ; and it may be con-

sidered rash in any one for making use of them. It would, truly, be very great rashness to apply them without some great object in view; but when no other remedies have been found capable of subduing the violence of a disease, it becomes our duty to disregard all prejudice, and use those means which experience has proved to possess some influence over that disease. The remedy proposed will be found perfectly safe in the hands of any one who has a knowledge of the laws of disease, and who will pay due attention to its effects on the system. The patient should be seen regularly two or three times in the course of the day, and the mouth and gums should be minutely examined every time. But, although I have seen from half a dram of calomel to two scruples taken every day by children for five or six days successively, yet I have never noticed the gums to become decidedly affected in any one case, excepting the two already mentioned: it is necessary, however, to be upon our guard in every instance, lest such an occurrence should happen. In every case which I have witnessed where the children have recovered, they soon gained strength, and became stout and fat after the calomel was left off; whereas, in general, where inflammation is subdued by enormous bleeding and purging, the constitution becomes shattered, and predisposed to various chronic diseases.

It would be unpardonable in any one to use violent remedies for diseases which might be subdued by milder means; we should, therefore, be certain that we do not mistake the characters of the disorder with which we have to contend. We must remember that there are several symptoms common to many diseases; for irritation of the bowels will, now and then, produce convulsions, and many other symptoms common to meningeal inflammation. But the symptoms must be all taken together before a conclusion is formed respecting the nature of the disease. He who has seen a few cases of meningeal inflammation cannot well mistake it; for, although it manifests many symptoms in common with various other disorders, yet there is something so peculiar in the expression of the countenance in this, which never occurs in other affections. But as the symptoms have already been commented upon, it is unnecessary to recur to that subject again.

In an essay like the present, only a few of the leading points of the disease can be noticed; there are several other minor points to be attended to, which may arise from circumstances connected with every case. What has been advanced is the result of experience in some scores, and, it may be said, hundreds of cases. The greater number of those which termin-

ated fatally were examined after death, and every appearance was compared with the symptoms during life. The antiphlogistic plan of treatment was at first tried to its fullest extent, but with no good effect. Calomel, in moderate doses, was also tried, and the effect of that was very equivocal; but, since it has been *more freely* administered, the results have been far more favourable. For the sake of safety, it is necessary to keep a strict watch over the patient while the mercury is being taken, and its quantity must be regulated according to its effects. When this is done, it can produce no mischievous consequences in one case out of a thousand, either in children or in grown persons. The mischief from mercury results only when its use is persisted in after the gums have become sore: it perhaps ought never to be an object to produce a profuse salivation. When a little mercury will affect the system, a little is enough to cure the disease, if that disease be curable by mercury. Children generally require much to produce that effect: much must therefore be given, if any good be expected from it; but it must be strictly watched, and discontinued as soon as the desired effect is produced.

II.

(From Anderson's Quarterly Journal.)

Original Cases with Dissections and Observations, illustrating the Use of the Stethoscope and Percussion in the Diagnosis of Diseases of the Chest; also, Commentaries on the same Subjects, selected and translated from Awenbrugger, Corvisart, Laennec, and others. By John Forbes, M. D. Physician to the Chichester Dispensary, London, 1824.

This is a practical work of great merit, and though it has been rapidly put together and published with great haste, it gives evidence that the author is an accurate observer, a learned and a skilful physician. In our opinion no apology was needed for the imperfections of his work; on the contrary, we think Dr. Forbes entitled to the thanks of every liberal-minded practitioner of medicine, for the valuable body of facts which he has brought forth in the present volume. No doubt, he is enamoured of the stethoscope, and is enthusiastic in its praise; but where do we ever meet with great improvements in science without enthusiasm, or consummate skill, without laborious perseverance?

It would appear, our author has observed, from the rapid sale of his translation of Laennec, and from the notice taken

of it in the Journals, that a considerable impression had been made on the public mind in favour of the stethoscope; but the impression seems not to have been a lasting one, as no case illustrative of its use has as yet been published.

"From this circumstance," says Dr. Forbes, "and from not having heard of its employment in any hospital, or indeed by any individual practitioner in this country (with the exception of my friend, Mr. Duncan, Jun. of Edinburgh,) I am led to fear that the impression made was more lively than profound, and that the influence of prejudice, theory, and indolence—one or all—the greatest medical improvement of the present age, is in danger of sharing the fate of those thousand idle and useless projects which daily spring up among us, and which, after obtaining a temporary notoriety, through the patronage of inexperienced and ovor-zealous individuals, soon sink into merited oblivion."

When the author published his translation, he was but little acquainted with mediate auscultation, and was an entire stranger to the employment of percussion; but since that time, he has frequently put both to the test of practice. Percussion indeed, seems hitherto to have been little known in this country; and though Awenbrugger's work was published so far back as 1760, and was favourably noticed at that time in the Leipsic Commentarii, a few only of the English works on general medicine have mentioned it in vague terms. Even Dr. Buchan in his Symptomatology, has confounded it with mediate auscultation, and that acute physician, Dr. Baron, has spoken of it as if it were the same thing with the succussion of Hippocrates. To render it more known, Dr. Forbes has given a translation of the original work of Awenbrugger, and has, at the same time, drawn up a summary account of auscultation; and he thus expresses his strong opinion of their utility as diagnostic measures in the practice of medicine:—

"During the last two years and a half," he observes, "I have been in the habitual employment of auscultation and percussion (more especially the former,) in my public and private practice, and in a pretty extensive field; and I can most conscientiously add, that the additional experience of every successive month and week, has only tended to increase more and more the confidence previously reposed in them. If I may be allowed to judge from the benefit which I have myself derived from them, in all the departments of medicine; in pathology, diagnosis, prognosis, and treatment, I cannot but consider their general adoption by the profession in this country, as an event to be most ardently desired, and their com-

parative rejection hitherto, as a circumstance to be much deplored."

As percussion and the stethoscope throw much light also, or rather certainty, on the pathology of pectoral complaints, we are enabled to form a much more correct prognosis than we could otherwise have done; a circumstance which is thus illustrated by our author.

"Suppose," he says, "two physicians of equal skill and experience, but only one an auscultator, met in consultation, for the first time, on a case of chronic pleurisy or peripneumony, in no very advanced stage. Probably the only remarkable symptoms are, a violent cough with little or no expectoration, more or less dyspnœa, especially on motion, and incapacity to assume, with comfort, certain postures; the pulse perhaps is natural, there is no pain, no febrile heat, no hectic, and inconsiderable loss of flesh; or, perhaps, one or other of these states may exist. From these general symptoms, will he who is not the auscultator venture to pronounce, with any degree of confidence, his opinion of the precise nature of the disease; much more, to declare it to be one that will almost certainly prove fatal, and scarcely even admit of relief from any kind of treatment? No practitioner, I affirm, judging from the common symptoms only, can be justified in entertaining such opinions. But if, to the examination of the symptoms, be superadded the exercise of percussion, or the exploration by the stethoscope, for only two or three minutes; and if the former elicits the preternatural or fleshy sound over the whole of one side of the chest, or the latter indicates the absence of respiration over the same space; then, at once, are obtained sufficient materials (conjointly with the previous history and present symptoms of the case) to form a correct diagnosis, and to justify and authorise the most ominous prognosis. Were the benefits of auscultation confined to this single case of disease, it would, even then, be entitled to the highest consideration."

The same observations will apply to the treatment of disease. If it is known to be incurable, the patient will be spared the exhibition of useless and disagreeable remedies; and the treatment which may be thought necessary will be founded on correct principles.

We will not discuss every subject which our author has so ably handled in his preface; but we agree with him in thinking that the dissection of dead bodies, however otherwise commendable, has been the occasion of many erroneous views connected with the pathology of diseases. Thus, the more striking phenomena of its last stage have been regarded as the

constituents of a disease, while comparatively little attention has been paid to the phenomena of its whole course.

"The truth," Dr. Forbes very justly observes, "unquestionably is, that there are many diseases, of the pathology of which we are entirely ignorant; and there is every reason for believing, that not a few of these, if really consisting in any change of organic structure, are of such a nature as will never be exhibited beneath the knife of the dissector. Nay more, it is certain that, even in those diseases with the pathology of which we seem to be well acquainted, almost all our beneficial practical efforts must be directed to a state of parts which preceded that which we see in the dead bodies of our patients. It is indeed with me, I confess, a matter of considerable doubt, whether we are not accustomed greatly to overrate the powers of our remedial agents, to remove diseases that consist in any considerable physical alteration of an organ; and whether, in our attempts to do so, we do not sometimes establish the morbid state, by interfering with the remedial powers of nature, which, perhaps, are alone capable to effect the wished-for change."

Trusting too much again to the remedial powers of nature, the practice of many eminent physicians has been feeble and unvarying, but such practice is far less blameable than the irrational vigour displayed by some British practitioners in the latter stages of disease.

In the greater number of recent inflammatory affections, perhaps the stethoscope may be dispensed with; but our author thinks that in all chronic diseases of the chest, in acute diseases which have become so, and in all cases of a doubtful nature, a *trial* at least of percussion and auscultation is almost indispensable. But they must on no account be adopted as guides of practice by any man, till, by considerable experience, he has satisfied himself of their correctness; and even when he has acquired experience, he must be cautious and circumspect in using them.

The cases published by our author are detailed at great length, that they may make a proportionably strong impression, by shewing the very grounds on which he came to his conclusions. These conclusions, he acknowledges, may be sometimes incorrect, but the explorations which gave rise to these were true and may be depended upon. But percussion and mediate auscultation he wishes to be *additional* only to the common symptoms, and not *exclusive* of them.

Having thus discussed the principal topics contained in our author's preface, we now proceed to give some account of per-

cussion and mediate auscultation, which is necessary to the complete understanding of our author's cases.

The method of percussion is founded on the property possessed by the human thorax, in common with most hollow bodies, of giving out certain sounds when struck in a particular manner. The sound elicited in this way from the healthy thorax or chest, resembles the sound of a drum when it is covered with a thick woollen cloth. It is observed on the right side anteriorly, from the clavicle to the sixth true rib; laterally, from the axilla to the seventh rib; and posteriorly, from the scapula to the second and third false ribs. Disease of the liver, however, or other abdominal organ, will sometimes contract the sonorous sphere as above described; to the state of these organs therefore, it will be necessary to attend. The left side yields the sound from the clavicle to the fourth true rib, anteriorly; and on the back and laterally in the same extent as the other side over the space occupied by the heart, the sound is duller than on the other parts; but it varies much in different persons. Except in the cardiac region the whole sternum yields as distinct a sound as the sides of the chest.—The same sound is perceptible over that part of the spinal column which is connected with the chest. But the sound in very fat persons is almost lost.

In percussion, the thorax should be struck gently with the points of the extended fingers brought close together; but percussion with the flat of the open hand is also useful. It should be performed more forcibly when the subject is a robust and fat person. In most cases it ought to be employed on the naked chest. During inspiration and retention of the breath, the sound is every where louder, and during its performance the patient should always be in the sitting posture. While undergoing percussion on the fore parts of the chest, the patient must hold his head erect, and his shoulders should be thrown back; for in this way a clear sound will be obtained. While the lateral parts of the chest are in the act of being struck, the patient should hold his arms across his head; and when the back is the part operated upon, the patient should bend forwards, and draw his shoulders towards the anterior parts of the chest.

When a distinct sound, commensurate to the degree of percussion, is not obtained from the sonorous regions above-mentioned, a morbid state of some part within the chest is indicated; and if, on percussion, a sonorous region of the chest yields only a sound like that of a fleshy limb when struck, disease exists in that region. And if the same sound still continues,

when the breath is held in after a deep inspiration, the disease is deep-seated in the chest; and if the same result is obtained, both before and behind, on points precisely opposite, the disease occupies the whole diameter of the chest.

The morbid sound occurs in acute and chronic diseases; and it always accompanies a copious effusion of fluid in the thoracic cavity.

The morbid sound which is observed in acute diseases, occurs during their progress, or at their termination. Percussion should be used in such cases; for an acute disease of the chest apparently over, has been known to end in a fatal vomica or a fatal scirrhus of the lungs. In peripneumony, or pleuro-peripneumony, if the inflammation is acute, the morbid sound is perceptible on the second, third, or fourth day at farthest; and, if the disease is to terminate fatally, the natural resource gradually lessens, and is entirely lost by the sixth or seventh day; but if recovery takes place it gradually reappears. The morbid sound occurs most frequently in inflammatory affections; but it may also be observed sometimes in epidemic exanthemata, previously to the eruption; and then the peculiar sound extends over the whole chest, and *is proportioned to the amount of the subsequent eruption.* The duller the sound, the severer the disease; and the more extensive its space, the more certain is its danger. The disease is most dangerous on the left side. A morbid sound on the superior and anterior part of the chest indicates less danger than on the inferior or posterior parts. The total want of sound, over a whole side, is in many instances a fatal sign. Its absence, along the course of the sternum, and over a large space in the origin of the heart, is also a fatal sign.

Percussion, as a diagnostic measure, is of much more essential service in chronic than in acute diseases; for in the former it will detect morbid changes, which could not otherwise have been known, or will point out danger where none was indicated by the ordinary symptoms.

Such are the few remarks explanatory of percussion, which we have thought it necessary to extract from the work of Awenbrugger, and the commentary of Corvisart; but we cannot too strongly recommend the whole to the attention of the reader.

We now proceed to mediate auscultation. We have already spoken of it in a former Journal, when reviewing the original work of Laennec; yet it will be proper to give some account of it in this place also.

"This method is founded," as Dr. Forbes informs us, "on

the well-known property of solid bodies to transmit sound with much greater readiness than is done through the air. In the present case, this property is applied to the discovery of the sounds produced in the interior of the chest, by the natural motions of the organs of circulation and respiration. From the modifications of these sounds, in health and disease, a judgment is formed respecting the actual state of the organs.

"The instrument used for this purpose is called the stethoscope. This consists simply of a cylinder of wood, a foot in length, perforated in its centre longitudinally, by a bore three lines in diameter, and formed so as to come apart in the middle, for the benefit of being more easily carried. One extremity of the cylinder is hollowed out into the form of a funnel to the depth of an inch and a half, which cavity can be obliterated at pleasure, by a piece of wood so constructed as to fit it exactly, with the exception of the central bore, which is continued through it, so as to render the instrument in all cases a pervious tube. The complete instrument—that is, with the funnel-shaped plug infixed—is used in exploring the signs obtained through the medium of the voice and the action of the heart; the other modification, or with the stopper removed, is for examining the sounds communicated by respiration. A solid cylinder, without any perforation, is the best instrument for exploring the action of the heart; but as this form is not so good for examining the voice and respiration, the perforated cylinder is commonly used for all purposes. On all occasions, the cylinder should be held in the manner of a pen, and the hand of the observer should be placed very close to the body of the patient, to ensure the correct application of the instrument.

"The end which is applied to the patient—that, namely, which contains the stopper or plug—ought to be slightly concave to insure its greater stability in application; and when there is much emaciation, it is sometimes necessary to insert between the ribs a piece of lint or cotton, or a leaf of paper, on which the instrument is to be placed, as, otherwise, the results might be affected by the imperfect application of the cylinder. The same precaution is necessary in the examination of the circulation, in cases where the sternum, at its lowest extremity, is drawn backwards, as frequently happens with shoemakers, and some other artisans."

There are three kinds of exploration by the stethoscope, viz. that of the voice, the respiration, and the circulation.

"The only diseases," says our author, "to the diagnosis of which the exploration of the voice has been applied with suc-

cess, are, Phthisis Pulmonalis, Pleurisy, and the Pneumo-Thorax.

" If we apply the stethoscope to the larynx or trachea of a person in health when speaking, we hear the voice of the individual as if coming directly from the point on which the instrument rests, and reaching our ear through the canal in it. In the second stage of phthisis, when tubercular excavations exist in the lungs, if the stethoscope be applied to the chest, over the site of one of these, the same transmission of voice through the tube is perceived. This phenomenon has been named *Pectoriloquism :* it is the pathognomonic sign of the morbid state just mentioned.

" In cases of pleurisy, with effusion of serous fluid, there is a partial transmission of the voice, somewhat resembling pectoriloquism, yet peculiarly modified so as to be easily distinguished from it : this is named *Hægophonism*, from a supposed resemblance that it bears to the voice of a goat.

" In certain cases of tubercular phthisis, and in that particular variety of pneumo-thorax, where the accompanying empyema communicates with the bronchia by means of a fistulous opening, the exploration of the voice conveys to the ear a peculiar sound, which bears a striking resemblance to that emitted by a cup of metal, glass, or porcelain, when gently struck with a pin, or into which a grain of sand is dropped. This sound has been named *Metallic Tinkling*, and is considered pathognomonic of the triple lesion above mentioned."

On applying the cylinder, with its funnel-shaped cavity open, to the breast of a healthy individual, we hear, during inspiration and expiration, a slight but extremely distinct sound, answering to the entrance of the air into, and its expulsion from, the air-cells of the lungs. It is almost equally distinct in every part of the chest, but more particularly in those points where the lungs, when dilated, approach nearest to the thoracic parietes. It is equally perceptible on the larynx, and on the cervical portion of the trachea.

In making this exploration, there should be no noise whatever in the vicinity of the patient. Many causes, especially the age of the individual, alter the intensity of the sound ; in children, for instance, it is very sonorous and even noisy. In them we seem to hear the dilatation of all the air-cells to their full extent ; while in adults, the dilatation seems to be but partial. In a few persons, the respiration always resembles that of children, and hence it is named *puerile*, in whatever age it may be met with In some morbid states the breathing becomes puerile. Where we can perceive the respiratory murmur distinctly, and uniformly in every part of the chest, we may be

assured that there is neither effusion into the cavity of the pleura, nor infarction in the substance of the lungs; and, on the contrary, when in some particular point respiration cannot be distinguished, we may conclude that the corresponding portion of the lungs within is become impermeable to the air. This failure of respiration is found to be a principal distinctive sign of peripneumony, pleurisy, hydrothorax, and all other diseases which impede the natural action of the lungs.

The natural sound of respiration is modified by being combined with other sounds in morbid states of the lungs; and such modifications have been denominated the *rattle.* For a description of the *creptous, mucous, sonorous, and sibilous rattle,* we refer the reader to the work itself.

The action of the heart, as explored by the stethoscope, is studied under three different relations, viz. of the *sound impulse* and *rythm.*

In ordinary circumstances, the stethoscope, applied between the cartilages of the fifth and sixth ribs, at the end of the sternum &c., conveys to the ear a distinct *sound,* even where the pulse is very feeble or imperceptible. This, in the healthy body, is double, so that each beat of the arterial pulse corresponds to two sounds. One of these is clear and rapid, and corresponds to the systole of the auricles; the other is more dull and prolonged, and indicates the contraction of the ventricles. In a state of health, the sound of the contractions of the ventricles is heard no where so strongly as in the cardic region: in certain states of disease it may be heard more distinctly in other places. The softening of the substance of the heart deadens the sounds of its contraction; as does also any impediment of the circulation. But it may be taken as a general fact, that the extent of sound is in the direct ratio of the thinness and weakness of the heart, and consequently, inversely, as its thickness and strength. The extent of sound is affected also by the size of the organ.

When the parietes of the heart are unnaturally thick, the *impulse* is usually so great as very sensibly to elevate the head of the observer, and sometimes to give a disagreeable shock to the ear. The more intense the hypertrophia, the longer time the impulse is perceptible. It is only felt during the systole of the ventricles. A strong impulse is the chief sign of hypertrophia; while dilatation of the heart is characterized by the absence of all impulse.

By the term of *rythm,* is meant the order of the contraction of the different parts of the heart, and the relative succession and duration of these, as perceived by the means of the steth-

oscope. But on these our limits will not permit us to enlarge.

The other modes of exploration, are mensuration, succussion, abdominal pressure, and measuring the volume of expired air after a full inspiration. *Mensuration* consists in the comparative admeasurement of the two sides of the chest by means of a cord or piece of tape, transversely from the spine to the sternum. This indicates two conditions of the chest; dilatation and contraction, and may assist in forming a diagnosis. *Succussion*, of which Hippocrates is considered to have been the author, consists simply in shaking the trunk, smartly and quickly, with the view of producing the sound of fluctuation when a fluid is accumulated in the chest: *abdominal pressure*, when applied beneath the short ribs, produces a painful suffocative feeling in peripneumony, with copious effusion into the chest; and when made in the præcondia, it has the same effect in dilatation of the heart, pericarditis, &c.; but, in general, it is little to be depended upon. *Measuring* the quantity of air inspired, which was first proposed by Mr. Abernethy, must be considered as highly important and ingenious; and it is by no means a matter of difficult execution; yet it may be doubted whether it be well adapted to weak lungs.

We now proceed to the consideration of the author's cases, thirty-nine in all, to which we despair of doing any thing like justice.

Case 1.—A blacksmith, aged thirty. The disease, hypertrophia with dilatation of the heart. Diseased valves. Dilatation of the aorta. Peripneumony. The affection of the heart seemed to be evident without the stethoscope; and that instrument failed to detect the peripneumony, in consequence, our author thinks, of the overwhelming action of the heart. Blood-letting was the only remedy in the least useful. The blood was not buffy. Dr. Forbes prognosticated death. If we except the peripneumony, he had formed a very correct judgment of the case.

Case 2.—A farm servant, aged sixty. Hypertrophia with dilatation of the heart in a moderate degree. Peripneumony and pleurisy. Dr. Forbes examined this man with the stethoscope only once; after which he ceased to be under his care. That instrument did not discover the peripneumony and pleurisy; but our author believes that they were of posterior occurrence. In this case the lips were slightly blue, and on dissection the foramen ovale was found open.

Case 3.—A strong day labourer, aged sixty-three. Dilatation and hypertrophia of the heart; which was predicted by

Dr. Forbes. The man apparently died of apoplexy, but the head was not examined.

Case 4.—A woman, aged thirty. Dilatation of the heart. Hæmatemesis. The case was complicated; but disease of the heart was evident without the stethoscope; nor was our author's prediction quite correct; the exploration, however, was made very imperfectly.

Case 5.—A shepherd, aged sixty. The common symptoms indicated disease of the heart or lungs; by the stethoscope—hypertrophia, with dilatation of the heart and valvular disease. Prognosis, death. In this case our author was disposed to rely on the certainty of his diagnosis; but no dissection was made.

Case 6.—A labourer, aged forty-eight, about twenty years ago had a complaint of the chest, following a rheumatic fever, with inflamed joints, &c. Within the last two years there is habitual dyspnœa, irregular pulse, or a somewhat purple colour of the cheeks. The heart is felt pulsating very distinctly in the epigastrium. Blood-letting invariably gives him relief; the blood always buffy and cupped. This man was examined by the stethoscope on the 27th of august, 1822; a few weeks after the removal of anasarca of the lower extremities by digitalis.

"The following," says Dr. Forbes, "is the note of this exploration in the Dispensary Journal:

The Heart.—"Action extremely irregular—a great many short and quick contractions of the ventricles, being followed by one or two slow ones: contraction of the auricles little perceived. *Impulse* moderate, perhaps somewhat more than natural. *Sound* perhaps not any thing more than natural, in degree, but there is, every now and then, to be heard a *silvery* sound, somewhat like the tone of a very faint bell; but there is no thrilling nor vibratory sound or sensation to be discovered. Palpitation having been excited, the impulse was found to be considerably increased; but even then, both the shock and sound were confined to the very region of the heart, being imperceptible along the upper half of the sternum, and hardly observable under the left clavicle.

"*Respiration* very audible over all the left side anteriorly, except in the cardic region; highly *puerile* under both clavicles; *very indistinct* over the lower half of the right side, yet still distinguishable, and more so posteriorly; distinctly audible over all the back on both sides, but weak in the lower half, and very strong (puerile) over all the superior part. There is no *rattle*. [The patient examined in a sitting posture."]

The second examination was made on the 21st of January, 1823, after severe dyspnœa and pain in the lower part of the left side. The following is the note of the exploration :—

Respiration.—" Puerile on the superior part of the left side anteriorly, and accompanied by a very loud, sonorous, rattle, evidently dependent on the presence of mucus, as it is always lessened in any particular point, and often removed by coughing and the act of expectoration. The sound of respiration, on this side, becomes gradually weaker in descending, and at length becomes very indistinct about an inch below the nipple, over all the inferior part of the chest anteriorly; laterally, and on the back, the line of indistinctness rises higher, insomuch that the sound of respiration is very insignificant over the whole of the lower parts of the back. Over a space of about two inches broad along the spine it is more distinct, and becomes much more so on the superior parts of the chest; still it is not puerile as on the anterior parts. On the right side the respiration is no where puerile, although I think it can be distinguished every where, except on the inferior parts. There is no rattle observable on this side.

" *Impulse* of the heart is perhaps somewhat greater than natural in the region of the heart, but the range of sound is not extensive, being inaudible over all the back, and only slightly audible on the right side anteriorly.

[" The character of the sound in the cardiac region, and the rythm of the heart is not noticed."]

The man died in June following. On dissection, the heart was found rather larger than natural.

" The mitral valve was completely altered both in form and structure; the different points of which it is composed being all coherent, and of a fibrous or semi-cartilaginous texture. The aurieulo-ventricular orifice was, in consequence, greatly contracted. It was perfectly round, with a thick, smooth lip, and admitted, with difficulty, the point of the fore finger. The aortal valves were sound.

" The right lung was universally adherent to the parietes of that side of the chest; in its structure it was more solid than natural, but not hepatized, and contained a great deal of serous fluid. The left lung was no where attached by disease to the neighbouring parts; it was quite sound in its texture internally, except that it also contained a morbid proportion of serum. The pleura, on this side, contained about half a pint of serum."

Dr. Forbes had given the following *diagnosis* of the case after the first exploration:—

"*Disease of the Heart: Not Hypertrophia—nor Dilatation—nor Valvular Disease? probably Hydropericardium*, and *perhaps chronic disease* [meaning pleurisy] *with water effused in the inferior parts of the Pleura?* This note I took with me to the examination of the body after death, with the addition of the word "*Peripneumony.*"

The case is styled Contraction of the mitral orifice. Slight dilatation of the heart. Chronic peripneumony. Anasarca of the lungs.

Case 7.—A carter, aged forty, March 14th, 1823. His complaints began about eight years ago. Organic disease of the heart, "monstrously strong pulse."

"*Stethoscope.*—Pulsation of the carotids most distinct and strong, and conveying a well-marked thrill to the finger, and a very loud grating sound by the stethoscope. *Impulse* of the heart very great in the cardiac region; *sound* very low, and hardly at all possessing the natural alternations indicating the successive contractions of the auricles and ventricles, but rather a *continuous murmur*, interrupted, occasionally, by a louder and harsher sound—but still very low. Under the right clavicle, and about the top of the sternum, the sound of the contraction of the ventricles is more distinct, and the grating sound as the contraction terminates, is very distinct—indeed very loud, and perhaps louder at the scapular extremity of the clavicle than at the sternal. Sound quite as loud under the sternum as immediately under the region of the heart." Prognosis, death within half a year.

October 10. "Has continued in the same state, going to his work, as a carter, several days every week. He has a constant sense of weight and oppression in the region of the heart; and this sense of oppression and obstruction is every now and then (as often as once in two or three days) suddenly aggravated to a most violent and overpowering degree, causing him instantly to stand still, and accompanied with great dyspnœa, and aching in all his limbs. Can only lie with his head high, and most easily on his back. There is now slight anasarca of the legs, and the whole body is leucophlegmatic." He has been bled frequently through the summer, sometimes so often as twice a week.

November 17. "Anasarca much increased. For some time he has hardly been able to lie down in bed. Without any previous warning, he was this day seized with hemiplegia of the right side and loss of voice. He died on the 11th December.

The body was examined the following day; and, previously to the dissection, our author read the following diagnosis of the case:—"*Hypertrophia, with dilatation of* (*one or both*) *the ventricles. Contraction of an orifice, or degeneration of the valves* (*mitral or sigmoid*) *of the left side. Dilatation of the arch of the aorta. Hydrothorax of the left side. Hydropericardium.*" The real state of the case was: "Hypertrophia of the right ventricle. Hypertrophia, with dilatation of the left. Ossification of the sigmoid valves. Dilatation of the arch of the aorta. Pleuritis and peripneumony of the left side." Upon the whole this is a case which puts mediate auscultation in a very favourable light. We regret that we have not room for our author's ingenious remarks on the action of the heart after the paralysis had supervened.

Case 8.—An ex-soldier, aged 40, had long complained of severe cough, and occasionally of violent pain across his chest. His pulse was regular. The following is a note of the exploration made with the stethoscope three weeks before his death:—

"*Action* of the heart regular; *impulse* considerable in the region of the heart; *sound* louder than natural in the same place and as low down as the angle of the short ribs, also towards the sternum; most audible with the open stethoscope; both the sound and *pulse* perceptible at the very extremity of the xiphoid; *sound* perceptible over all the right side (anteriorly,) but not very loud—more so in the middle than under the clavicle; about the nipple (right) and below it there seems to be impulse as well as sound. *Respiration* audible over the greater part of the *left* side (anteriorly;) attended, in the vicinity of the heart and under the clavicle, with a dry, sonorous rattle, very loud; *puerile* under the clavicle, and extremely puerile, and without any rattle, under the sternal eetremities of the 2d and 3d ribs; very indistinct over all the right side, yet still in some degree perceptible in most places, and where perceptible, accompanied by a slight crepitous rattle. Pectoriloquism not explored, except under the left clavicle, where it is wanting."

The following was our author's DIAGNOSIS, which he read previously to the dissection:—

"*Dilatation with Hypertrophia* (*slight,*) *especially of the right ventricle: heart otherwise natural? Left lung sound, especially in the superior lobe. Inflammation and consequent consolidation* (*in a considerable degree*) *of the greater part of the right lung. Larnyx or Trachea diseased, and affecting the œsophagus?*

Dissection ascertained that there was complete adhesion of

the pericardium of the heart.—Ossification of the pillars of the mitral valve.—Chronic peripneumony of the right lung.

This case shews the much greater difficulty which attends a correct diagnosis of the diseases of the heart, than of the lungs.

Case 9.—Mr. N—n, aged 40, has been subject all his life to indigestion. Two years ago he began to be affected with fits of breathlessness and palpitation, and at the same time had a severe cough. Blood-letting has given great and immediate relief. We regret that we have not room for the particulars of this very interesting case. In the latter days of his life, the patient suffered dreadfully from oppression in the cardiac region; but at no time was he in the habit of starting suddenly from sleep. Before death he was considerably anasarcous. To the gentleman who attended the dissection, Dr. Forbes read the following diagnosis, as he had formed it by several explorations with the stethoscope:—

"Hypertrophia with dilatation of the heart, especially of the right side; both in a moderate degree. Hydrops Pericardii? Pleuritic inflammation and serous effusion of the left side? Dissection gave enlarged heart, pericarditis, pleuritis."

Case 10.—Miss H. P., aged 21. She was affected with dyspnœa, dry cough, and almost constant palpitation of the heart. The pulse quick, small, and sharp. The complexion very pale, and the lips somewhat blue. For some days before death, the stomach was extremely irritable. Dissection ascertained, that there was hypertrophia with dilatation of the left ventricle,—dilatation of the right ventricle,—pericarditis,—hydrothorax.

"The application of the stethoscope" says Dr. Forbes, "in this case was so very imperfect and unsatisfactory, that it may almost seem misplaced in this collection. Its pathological interest, however, would make it worthy of being recorded, even if it bore no relation to the subject of auscultatory diagnosis. But this is by no means the case—since it will be found, on examination, that even the brief and superficial exploration instituted, if not sufficient to establish a clear diagnosis, was, at least, sufficiently corroborative of the fidelity of the stethoscope as a diagnostic guide. From the correctness of the results obtained, I think it may be safely inferred, that a fuller explanation would have produced a proportionate extent of knowledge. I shall only at present make one or two brief comments on the coincidence of the signs furnished by the stethoscope, with the appearances on dissection. (The general history of the case suggests some important practical

reflections, which I cannot now notice.)—The great enlargement of the heart was sufficiently indicated by the extension of the sound over every part of the chest: while the moderate degree of impulse coincided sufficiently well with the state of the ventricular parietes observed on dissection. The sounds of the heart's contractions were clear, and of the natural character in every respect, except as to intensity; accordingly, it was found, that the orifices and valves (the degeneration of which is the chief source of foreign sounds) were in a perfectly natural state. The strongly-marked *puerile respiration* observed under the clavicles, clearly pointed out the existence of obstruction of a considerable portion of the lungs, from some cause or other. The appearances on dissection satisfactorily showed the nature and extent of this obstruction; which, I think, would have been discovered during life, by even a single complete examination of the chest, either by the stethoscope or percussion.

Judging from my own experience, I am disposed to consider this sign of *puerile respiration*, when existing only partially, as one of great value in practice. It is one that is more readily and easily discovered than almost any other; and I think its indications are as much to be depended on. Its presence, in any one part of the chest, may, I think, be safely considered as pointing out the obstruction of a considerable portion of lung in some other part. To be sure, it affords no means of enabling us to judge of what nature, or in what place, this obstruction may be, but the certainty that obstruction exists, is often of great importance.

"For instance; if in any particular case, while hesitating in our opinion whether a patient has water in the chest or not, or copious pleuritic effusion or not—or scirrhus of the lung or not—&c., according as the common symptoms may lead us to infer in each case respectively:—if, on applying the stethoscope beneath the clavicle, we find, or do not find, *puerile respiration*, I think we are almost justified in making up our mind at once respecting the presence or absence of the morbid state in question. At least, I have no hesitation in giving it as my own opinion, that this sign is infinitely more to be depended on, than any of the common symptoms usually trusted to in such cases. And, for once, the sign is as readily learnt as the symptom; since this particular application of the instrument is not more troublesome, to either the physician or patient, than feeling the pulse, or examining the tongue, and scarcely requires more time. More than once, when for want of time or other reasons, I have been unable to explore the

chest thoroughly, I have been enabled from this sign alone, not merely to form a correcter diagnosis, but to institute a more appropriate practice, than I could have done without its aid. More than one instance of this kind, especially in cases of symptomatic hydrothorax, is given in the present volume."

Case 11.—(*supposed*) Chronic pericarditis.

Case 12.—(*supposed*) Dilatation of the heart from contraction of one of the valvular orifices.

Case 13.—(*supposed*) Original debility [extenuation] of the heart.

Case 14.—Angina pectoris, from (supposed) weakness of the parietes of the heart. (Nervous or spasmodic angina.)

These four cases are highly interesting, and the symptoms are detailed with great accuracy and minuteness; but as none of them had proved fatal at the time when Dr. Forbes published, we shall take no notice of any of them but the last, the case of Thomas Ide, a labourer, aged 37. This man had enjoyed good health till about nine years ago, when he began to have the following symptoms, which have troubled him more or less ever since:—

"A constant disagreeable sense of fluttering at the pit of the stomach, perceptible, but in a very slight degree, while in a state of quiescence, or gentle exercise, and at times instantly aggravated to a violent degree of beating, on using any severer bodily exertion. At these times the palpitation is attended with very great dyspnœa, and a universal and overpowering sense of feebleness and faintness. This description comprehends the whole of his uneasiness in the paroxysms, which have never come on but during bodily exertion. Severe labour of any kind, quick walking, or going up stairs with even moderate speed, will bring these on at any time. He has scarcely any other complaint."

The stethoscope gave the following results:—

"*The Heart.*—No *impulse* whatever in the cardiac region, or elsewhere. *Sound* in the cardiac region remarkably distinct,* but not particularly loud—the respective contractions of the auricles and ventricles unusually definite, and divided by a considerable interval of repose. Rythm and sound perfectly natural. Sound audible over all the chest; very distinct over both sides anteriorly, and nearly equally so; perceptible, but in a very moderate degree, on the back, and nearly equally so on both sides. The sound is perhaps as loud along the whole length of the sternum as in the region of the

*"This is no doubt owing greatly to the slowness of the pulse."

heart, and louder than under the left clavicle. Under the sternal extremity of the left clavicle, the sound is particularly clear, though not remarkably loud, the sound of the contraction of the *auricles* is, in particular, distinct and clear—much louder than that of the ventricles, and clearer than is usual. It would appear, also, that the interval of repose, between the contraction of the auricle, and the subsequent contraction of the ventricles, is longer than usual (the pulse is 60.)

"*Respiration* not much explored, but it is very low generally, except on voluntarily quickening the inspirations, when it is sufficiently audible, and of the natural character, wherever it was tried.

"The only medicine I prescribed for this man was a pill consisting of extract: colocynth. c. gr. ij. ext. hyoscyam. et. pil. hyd. a a. gr. iss. ipec: gr. ss.—(ij. h. s. quotidie.) These pills he continued to take for several months, and considered himself as *remarkably* benefited by their use.

"This is another good instance I conceive, of that numerous and distressing class of diseases which depend essentially on no other organic alteration than an unusually thin, or, at least, slightly dilated, and consequently weak state, of the ventricles of the heart. This condition of the organ is, as I have formerly observed, generally congenital, and predisposes to, and lays the foundation of many diseases, not only of the heart, but of the system *generally*. According to the particular nature of the exciting causes—their frequent or rare application, &c., whether bodily labour—mental anxiety—high-living, producing other diseases, such as dyspepsia, nervousness, &c. &c.; the native debility of the organ will be either stimulated into organic change, or will assume such violent derangement of function, as will emulate in severity, some of the most distressing of organic diseases. It is, I conceive, under such a state of things that these numerous cases of *Angina*, which do not prove speedily fatal—that is, which are not mere symptoms of organic disease of the heart—arise: And their origin is readily explained, since it seems to follow, as a natural consequence of structure, than an organ which is preternaturally weak, and at best inadequate to the due performance of its functions, should more readily suffer from morbific causes, than one that is vigorous.

"A preternaturally weak heart, that is, a heart whose muscular power is disproportioned, more or less, to the due impulsion of the blood through one or both circulations—the lungs and system generally—must be, and I believe is, the fruitful primary source of many disorders; and must and does, modify,

in a greater or less degree, almost all other diseases. A weak heart will necessarily occasion a languid circulation—a superabundance of blood in the veins generally, and in some parts of the system especially.

"The connexion of apoplexy with diseases of the heart is generally known; but I believe the influence of the very common congenital weakness, of which I am now speaking, in producing headache and other cerebral diseases, is but little attended to. I am, however, convinced, by experience, that this influence is a very general and a very powerful one.

"To judge from the history and general symptoms of Ide's case, one might be disposed to consider his disease to be as much an organic affection of the heart, as many others recorded in this volume, which certainly are so.

"The symptoms are, at least, apparently as severe as those of Mr. N's (Case 12); and yet, if the indications of the stethoscope are to be depended upon, the importance of the two diseases is very different, and the result will probably be also very different.

"In the present case, mediate auscultation points out no organic disease, unless it be the general thinness of the ventricular parietes, which unquestionably predisposes to serious and fatal disease (dilatation,) and would probably lead to it, under the constant stimulus of bodily labour, but which, under more favourable circumstances, and with due care, does not necessarily prevent the enjoyment of a moderate share of health, or even the attainment of longevity. In the other case, on the contrary, there exists (I presume) a morbid growth, which in its nature and from its situation, is almost certainly progressive, and which eventually, in defiance of all skill and care, must lead to inevitable death. In both these cases, it is probable that the cause of the paroxysm is the same, viz. the presence of a quantity of blood in the heart, too great, relatively to the powers of the organ, to transmit it; but in the one case the obstacle arises from the mechanical obstruction of the orifice through which it is to be propelled; while, in the other, it is the consequence of inadequate force in the propelling agent."

Case 15.—Miss ———, aged forty-three. Sympathetic Angina pectoris: known to be so by the stethoscope pointing out no organic disease. In this case the bowels were torpid, and the appetite impaired, and the patient had suffered much mental anxiety. She was enjoined to absolute rest in bed, an alterative pill was prescribed, with a stomachic bitter draught; and this plan was productive of great benefit; however, it was

many months before she got well. It is the opinion of Dr. Forbes, that such symptoms, in such a constitution, are the frequent forerunners of organic disease.

Case 16.—(*supposed*) Dilatation of the heart with contraction of an orifice.

Case 17.—(*supposed*) Hypertrophia with dilatation of the heart and contraction of an orifice.

Case 18.—(*supposed*) Hypertrophia with dilatation of the heart.

Case 19.—(*supposed*) Valvular disease with dilatation of the heart. Pulmonary catarrh.

The ordinary symptoms, in all the four cases, indicated very serious disease of the chest; and in three of them the heart was evidently diseased; though the stethoscope almost added *certainty* to *supposition*. But none of the patients having died the test of dissection is still wanting. The prognosis is death in two years at farthest.

This case, in which Dr. Forbes, without the stethoscope, would not have dared to prognosticate death, is one of those manifold affections usually classed under the comprehensive name of *asthma*.

Case 20.—Aneurism of the aorta; no way elucidated by the stethoscope.

Case 21.—Jane Groves, aged sixty. Cough and dyspnœa: the latter at one time much aggravated daily at three o'clock in the morning. Inability to lie down in bed; scanty urine; pulse very quick and irregular; the lips blue; the whole surface leucophlegmatic, and the legs œdematous.

"The *stethoscope* was, for the first and only time, applied to the anterior and lateral parts of the chest, as she lay in a semi-recumbent posture. The following are the results obtained: *respiration* puerile over the upper part of the left side anteriorly, as low as the middle of the mamma; audible, in a slight degree, below this, anteriorly, and also considerably lower on the side, but rather by means of a very slight *rattle* during inspiration, than by the regular and natural hiss of the breath (it is not perceptible during expiration): in no point of the lower half of the chest, is the sound of respiration one-sixth part so loud or distinct as over the upper half. On the right side the respiration is puerile, but in a less degree below the sternal end of the clavicle, and is slightly audible as low as the nipple, but not at all perceptible below this anteriorly, or laterally. There is no *rattle* on the superior parts of the left side; but there is a considerable mucous rattle, frequently obstructing the respiration in different points of the right side. [The patient expec-

torates a considerable quantity of mucus.] The *circulation* was not properly, indeed hardly at all, explored. It was, however, noted that the *sound* of the heart was not perceptible (with the *open* stethoscope, which only was used) at any distance beyond the cardiac region, and that the rythm was very irregular.

"*Percussion* was applied only along the sternum; and it was found that the sound was decidedly, and very considerably, duller over the lower third of this bone.

Diagnosis—"*Hydrothorax of both sides* (*symptomatic of diseased heart?—Peripneumonic engorgement of the lower left lobe?*"

On dissection, the case was ascertained to be symptomatic hydrothorax; hypertrophia with dilatation of the left ventricle; slight (recent) pleurisy.

Case 22.—May 2d, 1823. Mr. G———, aged forty-three, had lived in the West Indies, and had suffered from a slight liver disorder. Last November was attacked by an affection of the chest; there was no pain but extreme oppression and dyspnœa, and dread and horror of impending suffocation, and palpitation of the heart. These symptoms returned in paroxysms, but were not brought on by walking or other bodily exertion. The pulse, before and since, has been very irregular. Within the last eight days he has had a very severe paroxysm, and at times is quite unable to assume the horizontal posture; being always easiest when sitting and leaning forwards. He has a countenance of extreme anxiety. His eyes are bilious, his precordia prominent, and his tongue coated,

"With the stethoscope, the action of the heart seems moderate in respect of *impulse* and sound, but extremely irregular: there appears to be a great number of imperfect contractions of the ventricles, followed, at long intervals, by one that is pretty full and strong. The sound of the heart's contractions is very audible under the xiphoid, and, in a slight degree, along the lower half of the right side. It is little perceptible under either clavicle, and not at all on the back. There is nothing unusual or unnatural in the character of the *sound*, independently of the *rythm*. *Respiration* is *extremely puerile* whereever it is heard, viz. over all the superior parts of both sides anteriorly (the patient being in a sitting posture;) not audible below the nipple on either side (anteriorly,) especially the *right;* it is also puerile on the back, even in the lower parts, when the patient leans forward, and, while in this posture, the sound of respiration can be distinguished lower on the axillary face of

the right side, than when the body is kept erect. There is no rattle.

Diagnosis.—"*Hydrothorax; perhaps also hydropericardium; enlarged liver.*

"I prescribed V.S. ad unc. x. vel. xij. (with the view of procuring temporary relief,) a blister to the region of the heart, a pill consisting of three grains of blue pill and half a grain of pulv. digital. every night at bed time, and half an ounce of the infusion of digitalis every sixth hour.

"The benefit obtained by these means was very speedy, and most striking."

In this case, there could be little doubt of the existence of water in the chest; but the fact was ascertained by the stethoscope. The hydrothorax here was most likely symptomatic of organic disease; but if we could believe it to have been the primary affection, there is no reason to despair of ultimate recovery. May, 1824, Mr. G. still continues in tolerable health, but he is by no means free from his disease.

Case 23.—Of the same kind as the last, but with more decided marks of diseased heart.

Case 24.—"John Luffe, aged 66, ex-coachman, affected a year and a half with dyspnœa, greatly increased by motion of any kind, also with a frequent cough, attended with a good deal of expectoration. During the last two months his lower extremities have been œdematous, and he is now considerably anasarcous over the whole body. Since the appearance of the œdema, the urine has been very scanty and sedimentous. The pulse is very irregular. He has no pain. The stethoscope gives puerile respiration over all the right side, but detects no respiration whatever on the left side, before and behind. Percussion gives similar results, eliciting a distinct clear sound from the right side, and a dull fleshy sound from the left. Action of the heart not examined.

"Diagnosis. *Hydrothorax of the left side.*

"Prognosis. *Speedy death.*" He died suddenly four days after the examination. "The body was not allowed to be examined after death; but, after much intreaty, permission was granted to *tap* the chest. A lancet was, accordingly, passed into the thorax, through one of the intercostal spaces of the *left* back, about two inches from the spine, and under the lower angle of the scapula. A stream of limpid serum immediately issued from the puncture, and continued to flow until three or four pints were discharged. This fluid partially coagulated on the application of heat. Punctures were made into the *right* back, in different points, both above and below

the place of the incision on the left side, but not a drop of fluid of any kind was discharged." This is a case very favourable to mediate ausculation and percussion.

Case 25.—" Mr. A., aged 37 (*supposed*) Idiopathic Hydrothorax. The general symptoms are detailed at considerable length.

" The *stethoscope* applied to the anterior parts of the chest, gives the following results : *respiration* very distinct and very loud (puerile) over all the *right* side, and strongly puerile under the clavicle, without any rattle ; *inaudible* over all the *left* side, except immediately under the clavicle, where it is perceptible in a slight degree. No *impulse* whatever from the heart ; *sound* in the cardic region dull, and as if distant from the parietes of the chest, perceptible, in a moderate degree, over all the right and left side : rythm natural, and no foreign sound perceptible. Back not explored. Hægophonism not sought for." The patient died a short time after the exploration. The body was not allowed to be opened.

" The above," says our author, " is one of the clearest examples of hydrothorax that I ever met with ; and one which I am disposed to look upon as idiopathic, and therefore, as a very rare disease. Although there were certainly many reasons for inferring the presence of water in the chest, in this case, from the general symptoms, yet I hope I am not throwing any undue discredit on the common means of diagnosis, when I give it as my opinion, that the precise nature and extent of the disease could not have been ascertained by the general symptoms only. Both these important points were immediately ascertained by the stethoscope ; and if this knowledge was productive of no benefit in the treatment, this cannot be considered as any in that instrument. On the contrary, I have a strong conviction (alas too late !) that that instrument did point out most clearly a means of treatment, which, if adopted, might have afforded some prospect of saving the patient's most valuable life—I mean *paracentesis of the thorax.*"

Dr. Forbes thinks that in this case there was every reason to anticipate a happy result from the operation.

" In admitting its propriety in such cases, it is obvious," he says, " that the stethoscope becomes of the utmost value in pointing out the place of incision. In the present case, indeed, I think *percussion* would have answered nearly the same purpose ; but without one or other of these means, I have no hesitation in saying, that in making the incision, the operator might have been equally justified in thrusting his

trocar into the right side where there probably did not exist one drop of fluid, as into the left which was full of it!

Case 26.—Anasarca of the lungs—hydrothorax. In the diagnosis of this kind of anasarca, the stethoscope, as is confessed by Laennec, affords only partial assistance; but the presence of water in the right cavity of the pleura, was indicated by the usual sign of the absence of respiration.

Case 27.—Hydrothorax. The body was not opened.

"There seems," says Dr. Forbes, "little reason to doubt that the above was a case of hydrothorax, although the most unequivocal test was not applied. I detail it principally with the view of pointing out how the stethoscope, even when very imperfectly applied, may become a faithful index of the state of the pectoral organs. In my first examination of this case, in addition to the absence of the respiratory sound over the inferior parts of the chest, the respiration is stated to be (as it usually is in such cases) puerile under the clavicles. At the subsequent exploration of the 29th, when, from the general symptoms, there could hardly be any doubt of the diminution of the water in the chest, the cylinder discovered the respiration over the superior parts of the chest (where only it was applied) to be *much less puerile*, than it was formerly; thereby clearly indicating, by this simple change, that the effused fluid actually was lessened."

Case 28.—Mr. J. S. aged 30, a professional gentleman, Chronic pleurisy. Dilatation of the heart. This very interesting case, which terminated fatally, is detailed at great length; but we must confine ourselves to the exploration, the author's diagnosis, and the post mortem appearances. These certainly place the stethoscope and the diagnostic fact of Dr. Forbes in a very favourable light.

December 16, 1822. "Yesterday," he says, "I applied the *stethoscope* for the first time. The sound of respiration was found to be unnaturally distinct (puerile) over all the left side of the chest, before and behind, and extremely indistinct, indeed scarcely perceptible, on the deepest inspiration, over the whole of the right. There was no *rattle*. Impulse and sound of the heart rather great in the region of the heart, and the sound very distinct over all the right side anteriorly.

Diagnosis. *Pleurisy of the right side with copious effusion.*"

March 5, 1823. "Stethoscope. Respiration still *puerile* over all the *left* side before and behind, except in the region of the heart, where it is entirely absent. It is now also perceptible over the whole of the *right* side before and behind, but the sound is *very slight indeed* compared with that of the left. It

is less in the superior parts, immediately under the clavicle, than lower down, but it is not at all audible a couple of inches below the nipple. On this side the sound of respiration is not perceptible, as is usual, through the whole process of inspiration—a considerable part of the expansion of the chest taking place without any. There is no rattle on either side. *Pectoriloquism* exists no where ; but there is a very marked difference between the two sides while the patient is speaking ; there being a loud, clear, and thrilling sound on the right, which is hardly at all perceptible in any part on the left side : still there is no *transmission* of sound by the stethoscope, but merely *resonance under* it. (Is this *Hægophonism ?*) Percussion does not occasion the least uneasiness in any part, although performed with no feeble hand. It elicits a very dull sound over all the right side, and a clear one over all the left, except in the region of the heart. Action and rythm of the *heart*, quite natural, only quick ; impulse in the region of the heart, perhaps unnaturally great, and the sound very loud. Sound of the contractions very distinct over the whole of the chest anteriorly, and quite as distinctly on the right side as the left ; perhaps more distinct under the lower half of the sternum, and between it and the right nipple, than in the very region of the heart ;—not perceptible in the back (through the clothes.)

October 21. " STETHOSCOPE. Respiration as when last explored, on a very superficial trial. Much less distinct under the outer end of the right clavicle.

Heart. " Sound, and perhaps impulse greater than natural, certainly considerably so, when compared with the feebleness of the pulse ; and quite as audible on the left, or more so,—decidedly more audible under the right nipple, than on the outer side of the left chest, or indeed on any part of that side. No irregularity of rythm or peculiarity of sound. *Percussion* elicits a dull sound in the cardiac region, where respiration is not at all perceptible.

" From this time he got gradually weaker and more breathless, but without any cough or expectoration, and died on the 12th of November."

The body was examined next day. Previously to the dissection, Dr. Forbes read the following note of the *diagnostics* to the gentlemen attending :—

(" J. S.)—DIAGNOSTICS.—Dec. 1822. Pleurisy of right side, with copious effusion.

1823, March. Pleuritic effusion of right side still great, but diminished.

April 7th. Same results—no increased absorption of fluid, but rather the contrary.

June 21st. Attack of pleurisy of the left side, with considerable effusion, and compression of the lung, but less than on the right side; absorption of part of the fluid on the right side; absorption of part of the fluid on the right chest.

July 30th. Considerable absorption of fluid on both sides, but still a good deal on the inferior parts of both; probably adhesion has taken place over the greater part of the *right side*, between the lungs and pleura costalis, except on the inferior lobe.

Sept. 27th. Has had a fresh attack of inflammation,—I think peripneumony, and also a fresh pleurisy of the left side: —Left lung thickened and partially hepatized. Absorption of fluid of right side goes on, and adhesion and development of upper lobes on right side increased.

Oct. 20th. Much as before. Hepatization of the outer part of the right superior lobe?

"Post Mortem? Serous or sero-purulent effusion in both sides,—*most* on the left, but on the right *thickest*—adhesion of the lungs to the pleura wherever there is no effusion—e. g. the greater part of the right lung, and the upper lobe of the left probably. *Carnification* (See Laennec) of both lungs in different parts and degrees:—hepatization of outer part of right superior lobe, and also of left ditto. False membranes and cheesy crusts on different parts of pleura. Some tubercles?—*The Heart.* I am somewhat at a loss how to state my *expectations* respecting the state of this organ. There is no *internal* structural disease, but I think it is very likely that there is either effusion into the pericardium, or adhesion of this [membrane] to the heart, from inflammation. I expect also that the cavities [of the heart] are enlarged. Some reason must be found for the sound, and also impulse, being so very perceptible on the *right* side; but this may arise from many causes, besides the dilatation; such as the *natural narrowness* of the patient's chest, the induration of the right lung and its firm adhesion to the side, disease of the exterior of the heart or its membrane; or the pressure of fluid in the left cavity of the chest.

"*Dissection.—External appearance.*—Body considerably, yet not extremely emaciated. The right side of the chest is more flattened about the middle, and less rounded generally than the left, yet there is no sensible difference between the two on mensuration.

"On laying back the sternum, and the cartilages of the ribs

attached to it, the edges of both lungs were found adhering all along the sternal extremities of the ribs on both sides, so as entirely to close both cavities of the pleura. The greater part of the exposed space was filled by the heart and pericardium, which occupied the centre of the breast, and extended quite as far on the right as on the left of the middle of the sternum, the extreme point of the pericardium lying exactly under the right nipple. The pericardium was not tense, and contained about five ounces of a straw-coloured, limpid serum. The membrane was of its usual thickness, and exhibited no mark of inflammation or other morbid alteration on any point of its surface. The *heart* was considerably larger than the closed hand of the individual, and was estimated by us as being one-third above the natural size. It was flattened and flaccid, and somewhat rounder and blunter at the apex than is usual.—The right auricle was turgid with blood, and seemed therefore much larger than the left, but on examination there was no very obvious difference of size. The increased size of the heart was owing principally to simple dilatation of the cavities, although it was not found that there was (as is usually the case) either a proportionate extenuation or thickening of the ventricular parietes. On the contrary, these appeared of a thickness proportioned to the extent of the cavities, according to the ratio of the natural heart. The substance of both ventricles was flaccid, but that of the left was much softer than the right, yielding readily, almost like liver, to the pressure of the fingers. The parietes of the right ventricle varied in thickness in different parts (from one-third to one-sixth of an inch,) being thinnest near the origin of the pulmonary artery ; the parietes of the left ventricle were on an average less than double that of the right. The relative capacity of the two ventricles seemed natural. The walls of the left as well as the right collapsed on being cut. All the valves and outlets were perfectly natural.

" On the *left side* of the chest the upper lobe of the lungs was closely adhering to the chest by its whole surface, while all the rest of the lungs was separated from the side by a serous effusion, and compressed against the mediastinum into a compact substance, of the thickness of from half an inch to an inch, the anterior edge of which was attached, as already stated, to the cartilages of the ribs. The cavity of the pleura contained about sixteen ounces of a serous fluid like that found in the pericardium, and was lined throughout by a false membrane of a whitish colour, of the thickness of from a quarter to half an inch, and of a consistence varying, in different parts,

from that of a natural membrane to soft cheese,—the adherent surface being firm, and that in contact with the fluid soft and friable. The surface of this false membrane was rough, and gave origin to many soft bands which crossed the cavity from side to side. The upper lobe was considerably indurated throughout, yet could hardly be said to be hepatized. It answered to the state of parts called *carnification* by Laennec, or to his description of the first stage of peripneumony. It was more like red cellular substance than liver. It exuded, when cut, a frothy serum, and was very imperfectly crepitous. It was thickly studded with small, hard tubercles, scarcely any of which were of the size of a pea, and few of the size of a barley corn, and not one containing any soft, much less fluid matter. The lower lobes, compressed as already mentioned, were softer than the upper, and contained hardly any tubercles.

"The right lung was intimately and most firmly attached to the bounding parietes throughout every point. Of course there was no fluid. The adhesion was here every where strong and organized. The substance of the lung was considerably indurated, but more or less crepitous every where, except on the outer part of the superior lobe, where the induration was greater and the adhesions to the ribs firmer. When cut they exuded a frothy fluid. Including even the upper lobe, no part had a decided liver-like character. There were only a few small tubercles in this lung, and no appearance of pus in any part of the viscus. As the body lay on the back, flat on a table, the upper surface of the liver reached within an inch and a half or couple of inches of the nipple. The interspaces of the ribs were large on both sides, and equally so.

"The peritoneum contained a small quantity of serum.—The liver was of the natural size, and, with all the rest of the viscera, perfectly healthy.

Remarks.—"This case is interesting on many accounts. It affords an instance, at once, both of the acute and chronic pleurisy, and of dilatation of the heart. It is one of that numerous class of affections which are falsely included by many practitioners under the comprehensive term of consumption. It exhibits a satisfactory exemplification of the utility of the stethoscope in establishing a just diagnosis. By means of this instrument, the progress of the pleurisy was correctly traced; as there can be no doubt, from the appearances on dissection, that the progress was really such as was stated in the notes of diagnosis recorded during the patient's life. The error respecting the supposed existence of fluid in the inferior parts of

the *right* side (the only error in the diagnosis) was an error more of the observer than of the instrument; the latter justly showed the non-existence of respiration over the part in question, but the former falsely referred (*from theory*) this result to the compression of a portion of effused fluid supposed to be still remaining, in place of the natural encroachment of the liver.

"The same remark is equally applicable to the state of the heart. All the results of the stethoscopic examinations clearly indicated (according to Laennec) dilatation of the heart without extenuation of the parietes, and it is probable that this conclusion would have been at once adopted, without any hesitation, but for the obvious existence of other organic changes, which might possibly account for some of the results.

"Upon the whole, I think I may venture to hold up this case as affording an example of precision of diagnosis, not attainable by the ordinary mode of investigation, without the aid of mediate auscultation or percussion."

Case 29.—Chronic Pleurisy, with contraction of the chest. Fatal Peripneumony. The diagnosis was admirably assisted by the stethoscope; but permission was not obtained to examine the body In this case there was a fine example of the contraction of the chest, so beautifully described by Laennec, as occurring in consequence of chronic pleurisy. Dr. Forbes is surprised that Mr. Shaw, in his excellent work on Diseases of the Spine, should doubt the accuracy of Laennec's account of this morbid state of the parietes of the chest; as this is not the only one which, within the last twelve months, has fallen under our author's notice.

Case 30.—Acute, ending in Chronic Pleurisy. Contraction of the chest. Prognosis bad; but the patient was still living, May 19, 1824.

Case 31.—After examining this case with the stethoscope and percussion, our author gave this *diagnosis*: chronic pleurisy, with copious effusion, of the right side. The *prognosis* was, death within the year. This was given on the 8th of March; the patient died on the 4th of July following. Previously to laying open the thorax, the point of the scalpel was thrust into the right side of the chest, when a stream of serum issued forth. The lung of the same side was as hard as a scirrhous liver. This also Dr. Forbes suspected before death.

Case 32.—Pleuro-peripneumony. The patient was living when Dr. Forbes wrote; but he had predicted death, and had stated that there was copious effusion compressing the left lung. At the end of this case we have some interesting remarks on

the history of the paracentasis of the thorax. Mediate auscultation and percussion alone can give authority for performing the operation.

Case 33.—Pleuro-peripneumony.

Case 34.—(Supposed) Chronic Pleurisy.

The patients, in both these cases were living when Dr. Forbes published; the first will die; the other probably will recover. In the second Dr. Forbes formed his diagnosis before he applied the stethoscope, which however confirmed it.

Case 35.—Chronic Peripneumony. It terminated fatally, and dissection confirmed the diagnosis previously made. The ordinary symptoms, however, sufficiently characterized the disease. The peculiar respiration which attended it, and which seems to be a concomitant of chronic peripneumony, may be described as a variety of the *puerile*, only much lower, and abruptly cut short immediately after the commencement of each inspiration or expiration.

Case 36.—Chronic Peripneumony, without the usual symptoms. Its real nature was detected by dissection; but our author conceives that it would have been at once recognized by means of the stethoscope or percussion.

Case 37.—Pulmonary Catarrh or Bronchitis. In this case, the stethoscope indicated "very distinct respiration on the whole chest, before and behind, every where accompanied by a loud, sonorous rattle, loudest over the right side, and heard chiefly in expiration. The patient, aged 50, got well in about twenty days, by means of V. S. blistering, and an aperient, antimonial mixture.

Case 38.—(Suspected) Emphysema of the Lungs. The patient, aged 52, had been dyspeptic for thirty years; and now, July 1, 1824, has dyspnœa, cough, expectoration, looseness, or slight soreness of the throat. The stethoscope showed a very peculiar condition of the lungs; and there being a clear sound on percussion, and the absence of the usual respiratory sound over the whole chest—the pathognomonic sign of *emphysema of the lungs*, given by Laennec—our author is disposed to consider the disease as an example of this little known, though probably not very rare, affection.

Case 39.—Asthma. The result of the stethoscope is here given, during the paroxysm, or the day after it, and during the patient's ordinary health; and as in all the three states the sound of respiration is unnatural over the whole chest, our author thinks that it probably depends on *emphysema*, as in the preceding case.

The translation of Dr. Collins' Essay on the Physical Diag-

nosis of Diseases of the Chest, from which we have already made an extract or two, closes the volume.

We have thus finished our Review of this valuable Work. Our account of it is necessarily an imperfect one, and will convey to the reader but a faint idea of our author's merits; but our task, such as it is, has been executed with fidelity and care. We are inclined to think highly of the methods of diagnosis here advocated, and we have no hesitation in recommending the present work, in the strongest manner to the attention of practitioners. It is written in a style remarkable for its neatness and simplicity; such indeed as becomes a man of taste and education, and which is very rarely attained to by a person unacquainted with the ancient models of composition.

> **Quo semel est imbuta recens servabit odorem,**
> **Testa diu.——**

Seeing then that the literary attainments of Dr. Forbes are of so high a class, we are rather surprised that he did not give at once, in his own words, a condensed view of Awenbrugger's work, and Corvisart's Commentary on Percussion, instead of merely translating them in their original and quaint form. But we are not disposed to quarrel with him on this account, nor for his use of words, such as sharpish, puruloid, sedimentous, &c., which probably are not pure English; little specks, like these, being lost sight of in the general brilliancy of his merits.

MONTHLY SUMMARY

OF PRACTICAL MEDICINE.

I. ANATOMY AND PHYSIOLOGY.

Professor Bartell's *Experiments on six Decapitated Robbers.*

On the 14th October, 1811, six highway robbers were beheaded near Marburg; one of them was sixty years of age, the other five from twenty to thirty. At the instant when the head of the first fell, the trunk got up again, as if the individual had been about to rise upon his feet, while the bodies of the others fell down flat at the very moment: when a little after the heads were thrown at the foot of the scaffold, we

saw all the muscles of the face of the last executed completely relax, while those of the old man presented a general contraction, which lasted for a considerable time. These opposite effects took place without the occurrence of any difference in the mode of decapitation to which they could be attributed: with respect to this, it will not be useless to remark, that there remained at least two vertebræ attached to each of the heads. It was observed, that, at the moment of decapitation, the muscles of the face of the greater number of the heads contracted in a convulsive manner. As the head of the first decapitated had not been brought in with the rest, no other observations were made with regard to it. The second, which fell ten minutes after it, was observed without loss of time. It was tried at first to excite a contraction of the iris, by pricking that organ, but no apparent motion was obtained. The same operation having been made upon the iris of the third head, the pupil dilated a little, and again quickly contracted; while, at the same time, the pupil of the other eye (which had not been pricked) contracted, and again immediately dilated; an effect which Professor Trenderoth, as well as Messrs. Bunger and Herold, who were also present, saw in the most evident manner. Some minutes after decapitation, the bodies were opened; the heart contracted and dilated alternately with much force, in such a manner as to produce regular pulsations. At the end of ten minutes these motions had, it is true, abated a little; but they were always incessant, and the alternate contraction and dilatation preserved their regularity. Five minutes later, these motions had become unequal and very weak; they revived, however, when the heart was irritated by pinching it. A mechanical irritation made upon a branch of the great sympathetic, accelerated a little the motion of the heart, but only for a minute at most; the motion itself, however, continued for a long time, only decreasing in intensity. A puncture made in the transverse muscle of the abdomen of the same body occasioned strong convulsions, especially in the lower extremities, and yet the nerves had not been immediately irritated. A mechanical irritation made at the lower part of the spinal marrow, caused violent contractions in the muscles of the trunk, as well as in those of the neck, particularly those of the upper part, at the place of the section (which had already been frequently remarked.) On irritating the upper part of the spinal marrow of another head, convulsive motions were produced in the muscles of the face, and there resulted a movement of the tongue and surrounding muscles. In the third body, a motion was remarked in the

lower part of the trachea which remained attached to the trunk : this motion was accompanied with a sort of hissing,—an effect caused, without doubt, by the convulsive contractions of the muscles which had been cut. Similar motions took place in all the others. The head of the last decapitated was transported to the theatre, which, on account of the distance, occasioned the loss of an hour. Here, our first care was to try the duration of the galvanic irritation upon the different muscles of the head. The elevator muscle of the upper eyelid, and the superior oblique muscle, no longer contracted ; but the frontal muscles, the orbicularis palpebrarum, masseter, diagastric, &c. still continued to contract. The contractions ceased first in the masseter muscle ; they were prolonged in the buccinator. Two hours after execution, it had entirely ceased in all the muscles, and it could not be excited on moistening them anew.—In another head, cut off twenty minutes at least before the preceding, the galvanic irritation caused the depressor commissure labiarum, the orbicularis palpebrarum, and masseter, to contract ; this latter always much longer than the others. Two hours and three-quarters after decapitation, the muscles of this head appeared to have lost all irritability. Before concluding our experiments upon the head of the last decapitated, we exposed the pectoralis major and minor of a body which was brought in. The large pectoral muscle alone contracted under the influence of the galvanic fluid, the muscles of the abdomen no longer contracted. Contraction took place only in the right triceps muscle and in the sartorius ; they ceased always, in the latter, half an hour sooner than in the other. Irritation applied to the transverse muscle of this body no longer produced contraction, which we attributed to the circumstance that the body had been opened at the place of execution, after the first experiment. In another body which had been opened at the same time, the application of galvanism also produced some motions, as well as a feeble contraction, which was not renewed ; mechanical irritation produced none. An hour and a half after execution, the natural motion of the heart had ceased in the bodies already carried to the theatre. We were still, however, in hopes to produce contraction by means of irritation : not being able to get at the heart of the body which had been first opened, we proceeded to that of a body which had been newly opened. This last had also retained its heat, principally in the internal parts : the heart still retained a little blood, of a deep colour, in the left ventricle, which was partly fluid and partly coagulated ; but we could

not, either mechanically or by means of galvanism, excite any contraction of the muscular fibres of the heart.—*Lon. Med. Repository.*

II. SURGERY AND MIDWIFERY.

Mr. Snell's *Case of Anchylosis of the Joints of the Lower Jaw.*

On the occasion of a late temporary visit to one of the principal towns in Essex, to which I was called to remedy a congenital division of both hard and soft palate, with a peculiar formation of lion lip (the interesting particulars and satisfactory result of which case I hope shortly to bring before the Profession), I was waited on by Mrs. W., accompanied by her child, a healthy looking girl of eight years of age, whose jaws had been firmly closed for more than two years.

Mrs. W. gave me the following account of the child's case:—Nearly three years since a tumour had formed upon the left side of the lower jaw. Having applied to a Practitioner for its relief, he bound up the head and jaw tightly with a bandage and compress, purposing to cure it by pressure. This apparatus was worn for some weeks by the patient, being taken off occasionally only for the purpose of adjusting it anew. From some cause, inflammation attacked the jaw and face on the same side with the tumour, producing excruciating pain, and, at length, terminating in the formation of an abscess of considerable size, which pointed and burst externally through the cheek, a little below the left corner of the mouth. Relief, of course, was then obtained, and the inflammation soon partially subsided, leaving a large fistulous opening, which continued in a state of unhealthy ulceration, extending to the corner of the mouth. This was at length healed, but, in accomplishing it, cicatrices, as in case of burns, left the mouth drawn down in a frightful manner. It was not until after the bursting of the abscess and the subsidence of the inflammation, that the parents discovered that the child was unable to open its mouth.

At the time of her application to me the appearances were as follow:—The child was in the most perfect state of health, having a remarkably ruddy complexion. The jaws were firmly closed. The temporary anterior incisores, both above and below, had fallen out, giving place to those of the second set, which had passed through the gum until they met, and then became firmly locked one over the other. The tempora-

ry lateral incisores being protruded outwards, the permanent ones might be seen making their way behind them, and projecting into the mouth. The temporary cuspidati retained their original position. The molar teeth of both jaws were grimly closed upon each other; the inside of the cheek, on the effected side, having become attached to the gum at the necks of the molar teeth of the lower jaw. I made every attempt to ascertain whether or no anchylosis had taken place in one joint or both; but as I could not perceive, after repeated attempts, the least motion in any direction in both joints, I was induced to conclude that both were anchylosed.

From viewing the mouth, it appeared impossible that a sufficient quantity of food could be got into the stomach to support life. This, however, was accomplished by the little sufferer in a way altogether curious, though exceedingly pitiable. Bread and butter formed the principal bulk of her food, a portion of which was placed upon the inner part of the forefinger, and by it rubbed in between the interstices of the upper and lower teeth in those places where they were most separated. Milk was her constant drink, which was likewise sucked in through the teeth. It is almost incredible in how short a space of time she would contrive to introduce a sufficient supply of soft food to satisfy her craving stomach. Her speech was just what might be expected from the closed state of the teeth.

My proposed plan of treatment in this case was, firstly, the removal of all the front temporary teeth; and, secondly, that an instrument, resembling a speculum oris, should be constantly worn, so constructed that a spring should act upon both jaws in an opposite direction, the power being augmented according to the feelings of the patient. The first part of this plan was put into execution; but the second was altogether objected to by the parents, who stated, that since the removal of the teeth the child had experienced so little difficulty in taking her food, that they were perfectly satisfied with the result without any farther mechanical interference. The irregular advancement of the permanent teeth will soon, however, render this case worse than before. I have to regret that the distance from London, at which the patient resides, has prevented me from being again brought in contact with this singular case: but should my avocations again call me to that part of the country, I shall not fail to satisfy myself as to her progress, and to report any alteration of her pitiable condition.—*Lond. Med. Repository.*

Mr. Waller *on Gastrotomy.*

Every one who deviates from the common beaten track, and proposes any thing new towards the improvement of any art, science, or profession, must make up his mind to be assailed in every way that envy on the one hand, or ignorance on the other, can suggest. Thus it was with the illustrious Hunter, many of whose doctrines were at first treated with contempt; but, "magna est veritas et prevalebit," we find, now the grave has closed over him, that the most eminent men of the day are trying to outvie each other in their eulogies of him.

The operation of opening the abdomen for the removal of enlarged ovaria and other diseases, has been for some years recommended by Dr. Blundell, in his obstetric lectures. The experiments which he instituted on animals, with a view of throwing light on this subject, are detailed with great precision in his little work just published, entitled "Physiological and Pathological Researches;" and I think they fully justify us in believing that wounds of the peritoneum are not necessarily, nor perhaps generally, attended with those fatal effects which most of us have been taught to believe. That gastrotomy is attended with danger, no one will deny, and we must expect that fatal consequences will sometimes ensue; but I would ask, which of the established operations of surgery has not occasionally destroyed life, especially on its first introduction? A few failures, therefore, of this operation will not warrant us in condemning the practice altogether.

A very interesting paper on this subject has been published by Mr. Lizars, in the 81st Number of the Edinburgh Medical and Surgical Journal, wherein several cases are related, in which gastrotomy, to the extent of many inches, was performed, without destroying, or even obviously endangering life; and in two patients enlarged ovaria were extracted. In the present limited state of our experience, I conceive that any single fact tending to elucidate this point of practice is of service, as it is only by the accumulation of single facts that we can be enabled to decide the important question, whether recoveries from extensive gastrotomy are to be looked upon as exceptions, or as belonging to a general rule? I shall therefore, make no further apology for relating the effects it produced on a female I lately had an opportunity of seeing.

The patient herself gave me the account; it therefore cannot be expected that I could obtain all the particulars of her

case; but, as my object is merely to add one more to the list of recoveries after exposure of the abdominal cavity, I do not consider the tedious detail of every day's symptoms at all necessary. Suffice it to say, that a wound, to the extent of from three to four inches, was made into the cavity of the peritoneum, through the linea alba, beginning a little below the umbilicus. Towards the close of the operation, the patient became in a great degree insensible, though but little blood was lost; reaction followed in a few hours, and afterwards a diffused soreness, arising, I presume, from general inflammation. This was subdued by the usual means. The patient was extremely nervous, delicate, and irritable, and had a teazing cough: this latter circumstance, probably, prevented its healing by adhesion, for a period of twelve weeks elapsed before union was completed, during which time the discharge was copious. She is now as well as she was previously to the operation. The scar on the abdomen, of course, remains conspicuous.

In one of the cases above alluded to, and where Mr. Lizars himself operated, he says, after describing the incision, "I now proceeded to examine the state of the tumor, but, to my astonishment, could find none." I have reason to believe the same thing occurred to the female whose case I have related; and, if so, it strongly points out the necessity of carefully ascertaining the existence of a tumour previous to an operation; and, even when this is determined on, would it not be prudent at first to make a small opening, just sufficient to admit the finger, in order to guard against the possibility of being deceived. The abdomen of many hysterical patients is so large and so hard, that it may easily be mistaken for an enlarged ovarium, on a superficial examination. I well recollect a case of this kind, which occurred to myself: the patient said she was seven months' gone with child, and she had milk secreted in both breasts. She complained of so much pain about the cervix uteri, that she consented to submit to an examination; when I found the uterus of its natural unimpregnated size, and consequently considered it to be an enlarged ovarium. I requested my late valued friend, Mr. Crampton, to visit this case with me, when, to my great astonishment, the tumor was gone.

In Mr. Lizars' case, the wound, or at least nearly the whole of it, healed by adhesion,—in the case related above, by granulation; it seems, therefore, that in either case patients may recover.

In Mr. L.'s case, there was no collapse after the operation;

this symptom may, therefore, be regarded as accidental, and not as a necessary concomitant. In both, there appears to have been diffused inflammation of the peritoneum; but, in the case I have related, it occurred while the abdominal cavity was exposed to the air, as the healing process had not commenced, and yet the patient survived. Her constitution also was radically bad for any serious operation.

In Mr. L.'s case, the incision was commenced two inches from the ensiform cartilage, and extended to the crista of the pubis; the wound was, therefore, in this case, of a much greater extent.

One precaution taken by Mr. L. was, I think, very judicious, and which I shall therefore transcribe:—"As inflammation," he observes, "appears to be generally induced by exposure to cold, and as these cases succeeded so well in America, I desired the room to be heated to 80° Fahrenheit." When the temperature of the room had arrived at this heat, the operation was commenced. After the incision was made, the intestines, of course, protruded, and they were enveloped in a towel dipped in water about 98°." This is a hint which is worth taking advantage of in future operations of this nature; and I do confidently hope the time is not far distant when scirrhus and other diseases of the ovary will be radically and safely (as far as that term will apply to any operation of surgery,) cured by extraction.—*Lon. Med. and Phys. Journal.*

III. PATHOLOGY AND THERAPEUTICS.

M. Laennec *on the Italian system of treating Inflammation.*

We have several times alluded to the Italian system of treating inflammation by means of large doses of tartarised antimony: we have likewise mentioned that the practice had been adopted by M. Laennec; but have not, until now, been able to specify the exact manner in which this distinguished pathologist has employed the remedy. M. Laennec generally commences with four or six grains of the tartarised antimony, dissolved in four or six half-glasses (*demi-verres*) of infusion of orange-leaves, much sweetened; he then progressively increases the dose, generally without increasing the proportion of the vehicle,—that above mentioned being chosen with a view of avoiding nausea, and guarding against the emetic properties of the medicine. Of this solution, half a glass is to be taken every two hours. The first doses generally produce

evacuations, either upwards or downwards; but these soon cease if the remedy be persisted in, after which the dose may be increased to a certain point, at which (without our being able to foresee it, or to divine the cause,) the medicine will no longer be tolerated. It must then be forthwith suspended, as its use might do harm, even in very small quantities. "If," says this writer, "there were only one example of recovery from peripneumony under the use of tartarised antimony in large doses, it might with reason be attributed to chance, since no relation can be traced between the disease and the treatment,—the immediate effects of the medicine and the return to health; but, the multitude of facts obliging us to examine the matter more closely, we see with surprise ten or twelve grains of the tartarised antimony, taken for many days in succession, at first causing evacuations, and afterwards producing none. Often the disease runs its course notwithstanding, and the patient, escaping from the most imminent peril, is restored, as it were, by miracle."

It is of importance to know that no instance of abdominal inflammation has occurred from its use, in the practice of M. Laennec; and, when death has occurred, there has been a remarkable paleness of the mucous membrane of the stomach and bowels. It has likewise been used by him in accute hydrocephalus, in chorea, and in rheumatism affecting the joints. This practice is supported in France by the testimonies of MM. Laennec, Honore, Double, and Ribes; and appears to us to merit the attention of our professional brethren in this country.

M. Teallier *on the Effects of a very Hot and Prolonged Bath, in a Case of Chronic Rheumatism.*

A female, aged twenty-eight years, had experienced, during six months, rheumatic pains of the limbs: the joints, hands, and feet, were swollen, and scarcely capable of motion. The repeated application of leeches, of emollient cataplasms, warm-baths, and anodyne and camphorated embrocations, had produced a momentary relief of her sufferings. Her appetite was good, and the functions regular. A charlatan advised the patient to remain immersed, for the space of twelve hours, in a hot bath, the temperature of which he gradually raised *very nearly to that of ebullition.* She entered this bath at mid-day, and remained in it six hours, when she lost all re-

collections; an hour afterwards she was found entirely deprived of feeling, with her head supported by a board covering the bath. She was immediately taken out of the water. The face was enormously swollen and blackened; the eye-lids tumefied; the eyes distorted; the skin was of a dark-red colour, burning, and bloated; perfect loss of feeling and recollection; taciturn delirium; grinding of the teeth; foaming at the mouth; convulsions of the limbs, increased onthe slightest touch; respiration laborious and rattling; abdomen distended, particularly at the epigastrium; pulse hard, concentrated, frequent, and irregular.

She was blooded from the arm to the extent of twenty-eight ounces: the blood was red and vermilion. She recovered her recollection and speech, and the convulsions ceased: she now complained of pain at the epigastrium, and thirst. A large emollient cataplasm was applied to the epigastrium, and orangeade and ices were given her. She passed a restless night. On the following day the pain at the epigastrium was very severe: forty leeches were applied to this region, and gave much relief. On the third day, she complained of pain about the umbilicus: the application of twenty leeches afforded instant relief. Cataplasms, emollient lavements, and refreshing drinks, were administered during eight days: she recovered perfectly. Six weeks afterwards, the whole of the epidermis came from her body. Eleven months have elapsed, and she has had no return of the rheumatism.—*Lond. Med. Repository.*

Mr. Anderson's *Fatal Case of Irritative Fever.*

Mrs. C., aged forty, of a strong, healthy constitution, and mother of a large family, whilst in the daily practice of washing and dressing a suppurating wound in the neck of one of her children, complained of pain and tenderness in the last joint of the middle finger of her right hand; the knuckle of which was swelled and inflamed, and on the inner side there appeared the remains of a slight scratch or wound, of which she could give no account. She was desired to apply the liq. plumbi acet. dilut. to the part affected, and on my next visit the pain and inflammation had subsided. The following day she felt considerable pain above the clavicle on that side, extending to the ear, although there was no external appearance of inflamma-

tion in that part, nor any tenderness in the arm or finger first affected. As she had become rather feverish, she took some purgative medicine, and afterwards the mist. salin. cum vin. antim.

The next day, the pain had increased along the side of the head; and the same night she was seized with delirium, which, however, left her in the morning. The pain above the clavicle had now subsided, and she complained only of a slight head-ach and want of sleep; her pulse was about ninety, and her skin cool and moist. She passed the day very tranquilly, but again became delirious through the night; which continued at intervals during the following day, when she was seen by Dr. Babington, who, upon learning the history of the case, proposed that Mr. Travers should be consulted the next morning.

When we visited Mrs. C. the following day, we found her very delirious, with a rapid pulse and constant watchfulness. Mr. Travers, conceiving that the present symptoms might arise from irritation of matter under the sheath of the tendon, made a deep incision into the joint of the finger, from whence a very small quantity of matter was evacuated; but the symptoms were not relieved by the operation. She was bled, and took purgative medicines, which latter acted very freely: and at night a large dose of opium was administered, but without procuring her any sleep. Twenty-four leeches were applied to the hand and arm, which were constantly kept fomented and poulticed. On the next day she was again bled, and took the mist. camph. cum ext. hyoscyam. every four hours; but without experiencing any diminution of the delirium, and without producing sleep.

In this manner she continued for some days, when, finding her strength much reduced, she was ordered dec. cinch. cum acid. sulph. dilut. Her restlessness and incessant delirium continued to increase, until she died, which event took place about three weeks from her first complaining.

Upon examining the hand and arm after death, the tendons in the palm of the hand were found in a sloughy state, and a collection of matter had formed under the ligament. annul. of the wrist; but the whole of the arm appeared free from disease.

In this case a very remarkable circumstance occurred: the servant who fomented and poulticed Mrs. C.'s hand, in a few days after the finger was opened, was attacked with violent inflamation and swelling of the hand and fingers, afterwards

extending to the arm; and several collections of matter were formed, which were opened. Her health suffered so severely from this attack, as to excite for some time considerable apprehensions for her life.—*London Med. and Phys. Journal.*

Mr. Shatte *on the Utility of Fresh Vegetables in Fever.*

We have received a letter from Mr. S. Shatte, of Stokenham, Devon, the purport of which is to call to our notice a practice formerly recommended by some of the ancient writers on medicine, and which, he says, he has found of great service in fevers of the typhoid kind. A short extract from our venerable correspondent's letter, will explain his meaning sufficiently.

"In 1821, when typhous fever was very prevalent in this neighbourhood, I made several trials of this remedy. G. F., in the village of Chillington, who was taken ill with that disease, having a wife and two children, with only two small rooms up stairs: I immediately had the rooms and the bed covered with wet bushes or boughs of ash, hazle, willow, or any green shrubs that could be procured. The old ones were carried out, and fresh ones brought in every morning; and I am of opinion that, when they are brought in with the dew upon them, they are more efficacious: at all events, they must be made very wet with cold water, and be in considerable quantities, so as to cover the whole room."

In one case, our correspondent adds that they appeared to revive a patient almost at the point of death.

Mr. S. adds several quotations from Fernelius, Nic. Fontano, &c. who advocate the same practice; and finally he objects, and we think with great reason, to the abstraction of large quantities of blood in pure fever likely to assume a typhoid character.—*London Med. and Phys. Journal.*